CLIMATE CHANGE, TECHNOLOGY, AND TOPONYMY IN THE CULTURAL LANDSCAPE OF NUNAVUT

BY

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THESIS

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ABSTRACT

Nunavut, in the Canadian Arctic, is the "Ground Zero" of acute climatic and technological change. As this landscape transforms, the place-based knowledge of the native Inuit is under threat. According to recent psychological research, societal problems such as youth suicide, stem from the Inuit losing connections with their homeland. This thesis explores the relationship between climate change, technology, and toponymy (place-naming) among the Inuit of Nunavut so as to propose a richer kinship between the arctic landscape and the Inuit. Since prehistoric times, Inuit place naming has recognized natural flows in culturally significant sites. However, sea ice has been vanishing in Nunavut since around the 1970s and, consequently, traditionally named places have become increasingly inaccessible to the Inuit. In this thesis, three different forms of landscape representation—westernized scientific mapping, indigenous mapping, and design research diagram—are used to visualize this inaccessibility of traditional places through different seasons as well as over generations. During this period of sea ice related shifts, Inuit habitation has transitioned from seasonal camps to modern towns. Though modern place names have different scales, patterns, and meanings compared to their traditional counterparts, they nevertheless remain a responsive negotiation between Inuit lives and the arctic landscape. Seeing technological and climatic change in ecological continuum instead of as disruption will help keep traditional place names alive while opening opportunities for meaningful new names. Building on grounded landscape speculations and anthropological views to synthesize spatial practices, the goal of this thesis is to design six new places worthy of being named by the Inuit and added to their native index of place names. In these new places worthy of being named, energy, matter, and information are inflected flows speaking to environmental fluctuations. Naming of these new natural flows on site is a part of a collective effort to construct new urban situations. It recognizes the current generation's knowledge and transfers the power of public space into robust social infrastructure for modern cultural practices. In an age when the Arctic is a new hinterland for development, this thesis proposes a framework for future arctic urbanism that respects local history and shared societal values.

Keywords: sea ice, place naming (toponymy), ecological continuum, spatial practices, Arctic urbanism, Nunavut, climate change

ACKNOWLEDGEMENTS

It is a genuine pleasure to express my deep sense of thanks and gratitude to all my committee members, who helped me develop my thesis framework at every stage, kept keen interest on my work and shared their genius ideas with me. I also own my sincere gratitude to all the faculty members of Landscape Architecture Department, who funded and encouraged me to travel to the North, and my lovely fellow students, who critiqued my work and accompanied me along my traveling.

When I first read about the Inuit life under climate change on National Geographic Magazine in Spring, 2016, I started thinking about what landscape architects can help. In the past year, I was able to immerse myself into this thesis, gradually patched up pieces of stories and facts, and come to realize a landscape architect's role for social justice. This thesis is about how landscape architecture can be an appropriate discipline to rethink the eagerness of some to capitalize landscape, especially when the inhabitants of this landscape are not from the empowered class—they are the indigenous people such as the Inuit.

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CHAPTER 1 INTRODUCTION AND VISION

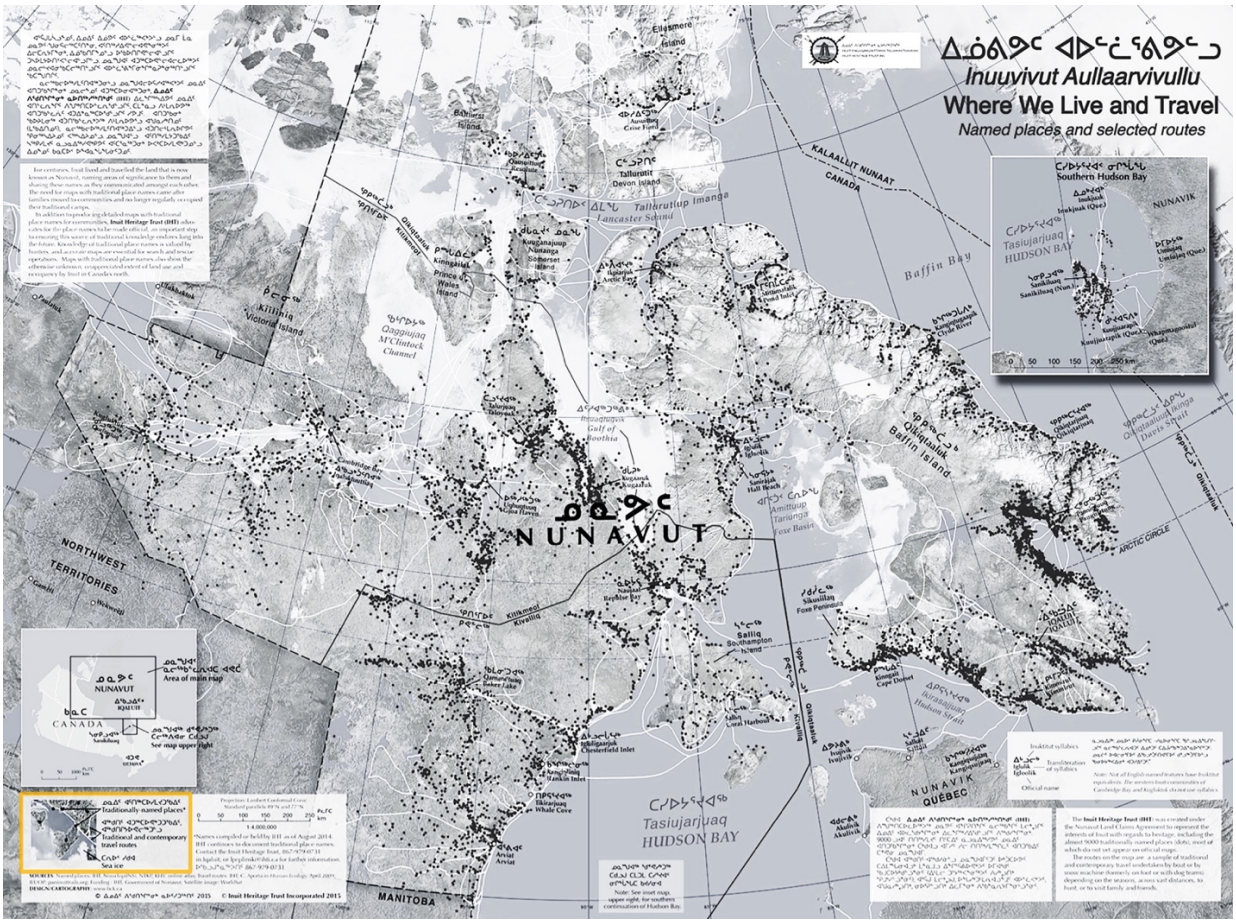


Figure 1 Map: *Nunavut, Where We Live and Travel*
Map source: Introduction- Place Names in Nunavut, http://ihti.ca/eng/place-names/pn-index.html?agree=o

On one morning in June 2015, the residents of Nunavut found a gift from the Inuit Heritage Trust in each post office box. It was a traditional place name map prepared to be made official by the government of Canada.

Ground Zero of Various Changes

1. Study site

Nunavut is the most recently founded, largest, and northernmost territory of Canada (**Figure 2**). The Inuit make up a large portion of its current population. The Inuit settlements in this region can be traced back to nearly 4,000 years ago, and their relocation by the Canadian government and consequent urban densification started only as recently as the 1950s (Tester and Kulchyski 102). Nunavut's official separation from the Northwest Territories was made official on April 1, 1999, through the Nunavut Act and the Nunavut Land Claims Agreement Act (https://en.wikipedia.org/wiki/Nunavut).

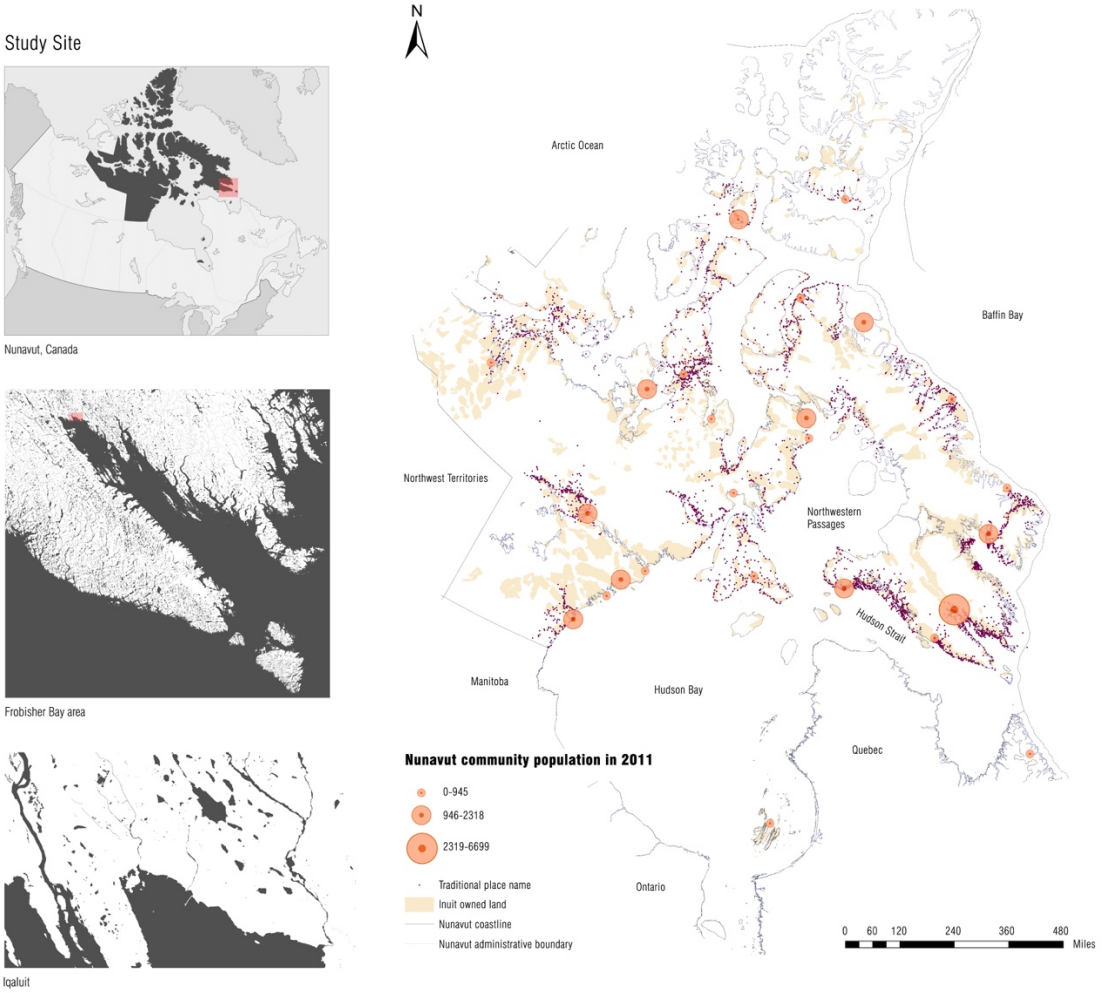


Figure 2 Nunavut is the most recently founded, largest, and northernmost territory of Canada. Iqaluit is the zoomed-in study site for this thesis (edited by author, data source: Nunavut Population Counts by Region and Community, 1981 to 2011 Censuses, file prepared by Nunavut Bureau of Statistics, February 8, 2012).

2. Contexts of study site

Architects and urban designers have made successive attempts to urbanize of the Arctic region since the beginning of 1900s. Those proposed arctic urban developments have gone through several stages, from the design of buildings that were climate-responsive, to "new eco-utopian" towns, to modern cities and communities gradually emerging along with various industries and military complexes (Jull and Cho 1). As Jull and Cho have observed, "the topology of arctic urbanism is a legacy of political and economic cycles competing against geographical and environmental inertia" (1). In the meanwhile, as claimed before the House Standing Committee on Aboriginal Affairs by lawyers of Makavik Corporation, who represented the Inuit of Inukjuak, in Arctic Quebec, the federal government "used" the Inuit at the beginning of 1950s to assert its sovereignty in the Arctic (Tester and Kulchyski 102).

The way the Inuit were "used" to claim Arctic territory was by relocating the historically nomadic people to gradually densified urban settlements. From vast land to small communities, the Inuit have gone through urbanization as the southerners have. However, zooming in to the typical form of "low density, single family detached homes with yards and driveways, a scattering of administrative, commercial, cultural buildings, schools, above-ground infrastructure and utilidors, and an adjacent airport and small dock for connecting the city to the outside world," the urbanization of the Arctic is actually direct suburbanization (Jull and Cho 2). Without efficient fundamental infrastructure, robust social reciprocities within and with the outside, and unique cultural expressions, the sprawling placelessness found in many developing regions has taken hold in the Arctic and consumed the vitality of Nunavut.

There are 25 communities dotting this most isolated territory with highest costs nationally in terms of transportation, logistics, education, and other aspects of social life. The Inuit have their own land claimed by traditional toponyms, within which is some vast land where they are denied subsurface rights, though they own the surface (**Figure 3**); the youth population is rapidly growing here, and so is the suicide rate (Hicks 5-6, **Figure 4**); the salary rate starts much higher than in southern regions, but food prices are proportionally even higher than that (**Figure 5**).

Like many regions in the Arctic today, Nunavut is facing climate change, oil and gas development, territorial contentions, and long-standing social problems such as alcoholism, unemployment, and domestic violence. It is the "Ground Zero" of acute technological and environmental change. Since the

relocation (with only Royal Canadian Mounted Police (RCMP), the military, and weather stations left in the far north) in the 1950s (Mathisen 14) and climate change starting in the 1960s, the introduction of capitalism and technology and the exposure to unpredictable environmental conditions have been widely conceived as a sharp break from the past for most traditional communities. As this landscape transforms, the place-based knowledge of the native Inuit is under threat. Younger generations have lost connections with their elders. Among various kinds of "social diseases" from which many arctic societies are suffering today, youth suicide seems to be the most worrying. Researchers pointed out that these suicides usually happen in clusters and are resulting from forced relocation, physically and mentally, and consequent lack of interactions with land (Eades 7).

The dominant approaches for most arctic engagements are "Climate Apocalypse-Deterministic Landscape," "Treasure Trove-Commodified Landscape," and "Territorial Conquest-Vied Landscape," which either treat the northern land as stagnant, inert, and isolated or mark it as commodity that can be priced and traded (Jull and Cho 1-5). Although, in recent years, there have been nonstop oil and gas developments in the Arctic, not many contemporary architects and landscape architects have contributed their design thinking and practices to this distinct situation. Architectural firms, such as Lateral Office in Canada, have done systematic and thoughtful projects that proposed creative architecture and connective infrastructure for improvements of Inuit health (Health Hangars: Airport / Hospital Hybrids, Nunavut, Canada, 2010), education (Liquid Commons Unit: Mobile Arctic School, Hudson Strait, NU/QC, Canada 2010), food (Arctic Food Network: Regional Food-gathering Cabins, Baffin Island region, Nunavut, Canada 2011-2012), and recreation (Drift-Pass: Skating Trail Pavilion, Winnipeg, Manitoba 2012-13). These projects are grounded works based on the unique seasonality, culture, and geographic realities of the northern communities. However, they are more architecture-based approaches, which by carefully confining space have not unleashed the potentials of possible dialogues with local natural forces—which are described as continuously changing, productive, and robust in Barry Lopez's *Arctic Dreams: Imagination and Desire in a Northern Landscape*. Architect and urbanist Alex Wall noted in "Programming the urban surface" that urbanism today is "dynamic and temporal," and it is the processes of urbanization instead of forms of urban space that should be paid attention to (Wall 235)." Moreover, designing for communities like the Inuit, who have strong oral traditions and related spatial practices, is especially challenging because traditionally named places have been gradually inaccessible under climate change. As pointed out by geographer Gwilym Lucas Eades,

"Language is itself memetic, providing forms and structures that persist through time to embody the cultures and lands of its speakers" (Eades 11). If the landscape that has nurtured the oral traditions is shifting, where are the associated spatial practices heading? To somehow answer this question can be very critical to the social impacts of any design here. However, few designers have noticed this close relationship between language and landscape in the Arctic region.

Current anthropocentric approaches adopted by urbanists need to be reframed. Future development of this newly established capital-accumulation hinterland should be not be merely about channelizing capitalism and improving economy. Landscape architecture is an appropriate discipline through which to rethink the eagerness of some to capitalize the thawing land and withdrawing ice. As indicated by the mistakes realized during the history of arctic towns, there ought to be a richer kinship with the land people inhabit.

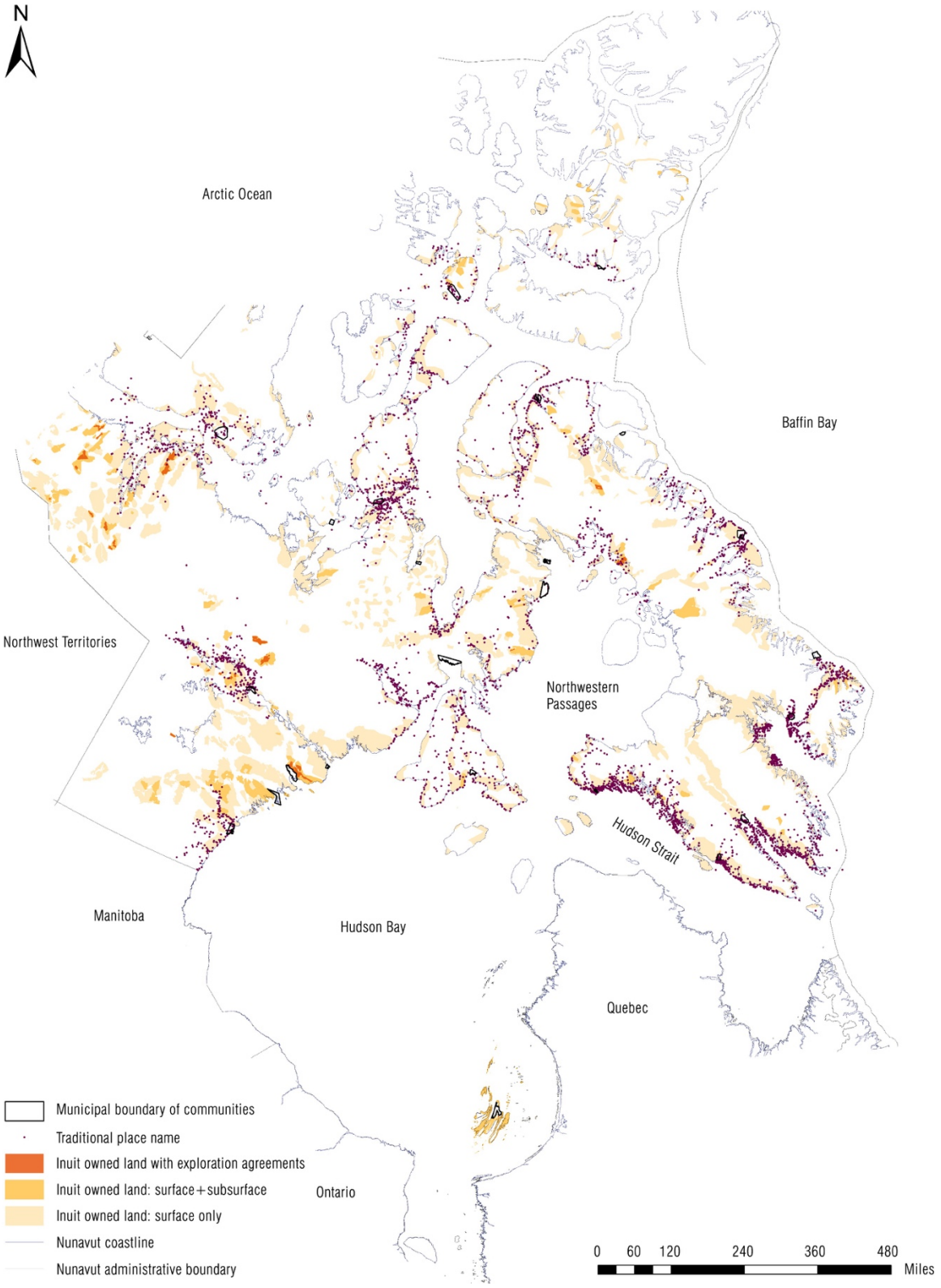


Figure 3 The Inuit have their own land with traditional toponyms. There is vast land where they are denied subsurface rights, though they own the surface (edited by author, data source: Sub-surface Inuit Owned Lands Parcels and Exploration Agreements).

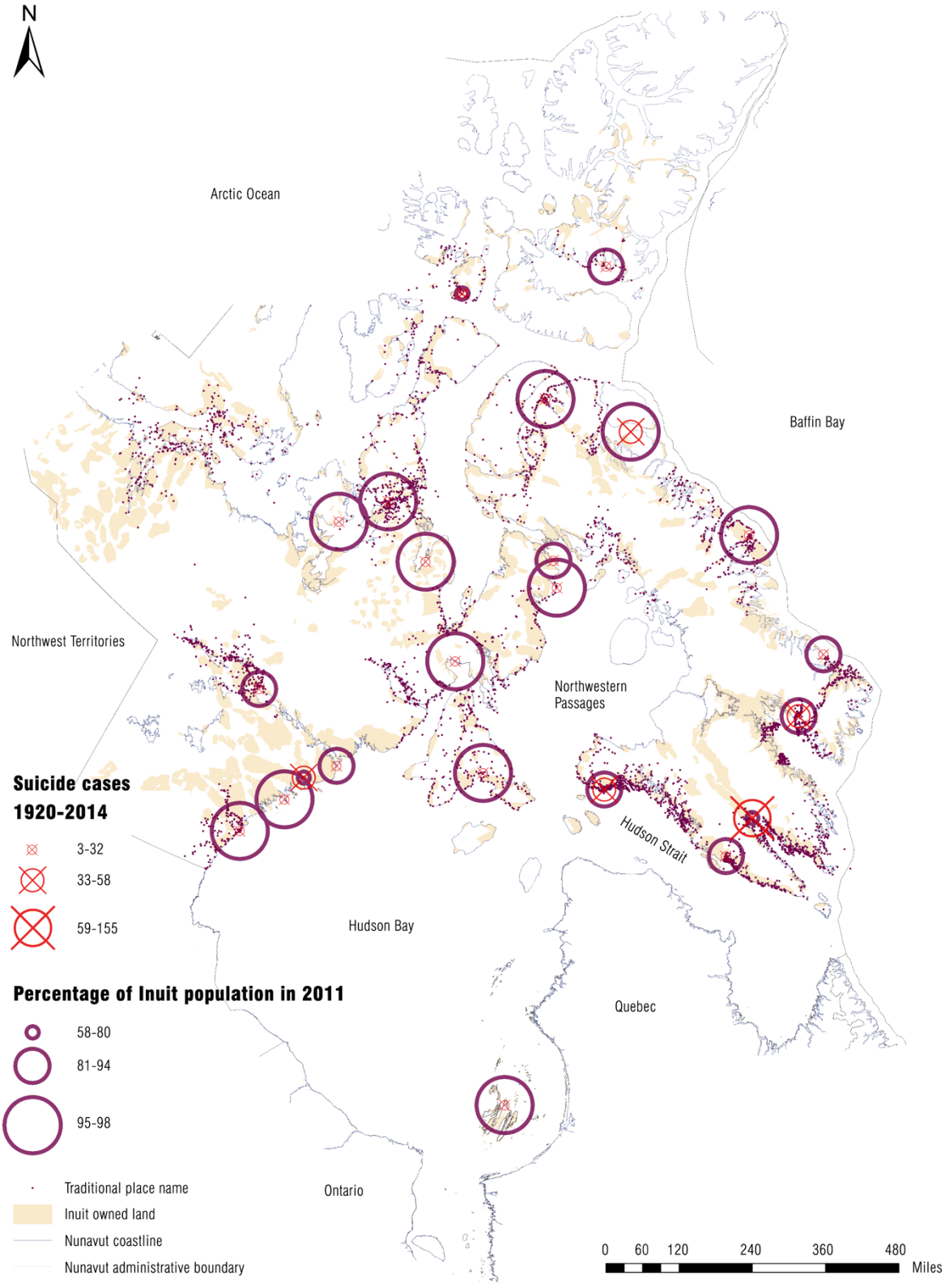


Figure 4 Percentage of Inuit in communities in 2011 and numbers of individuals who committed suicide from 1920-2014 (edited by author, data source: Statistical data on death by suicide by Nunavut Inuit, 1920 to 2014).

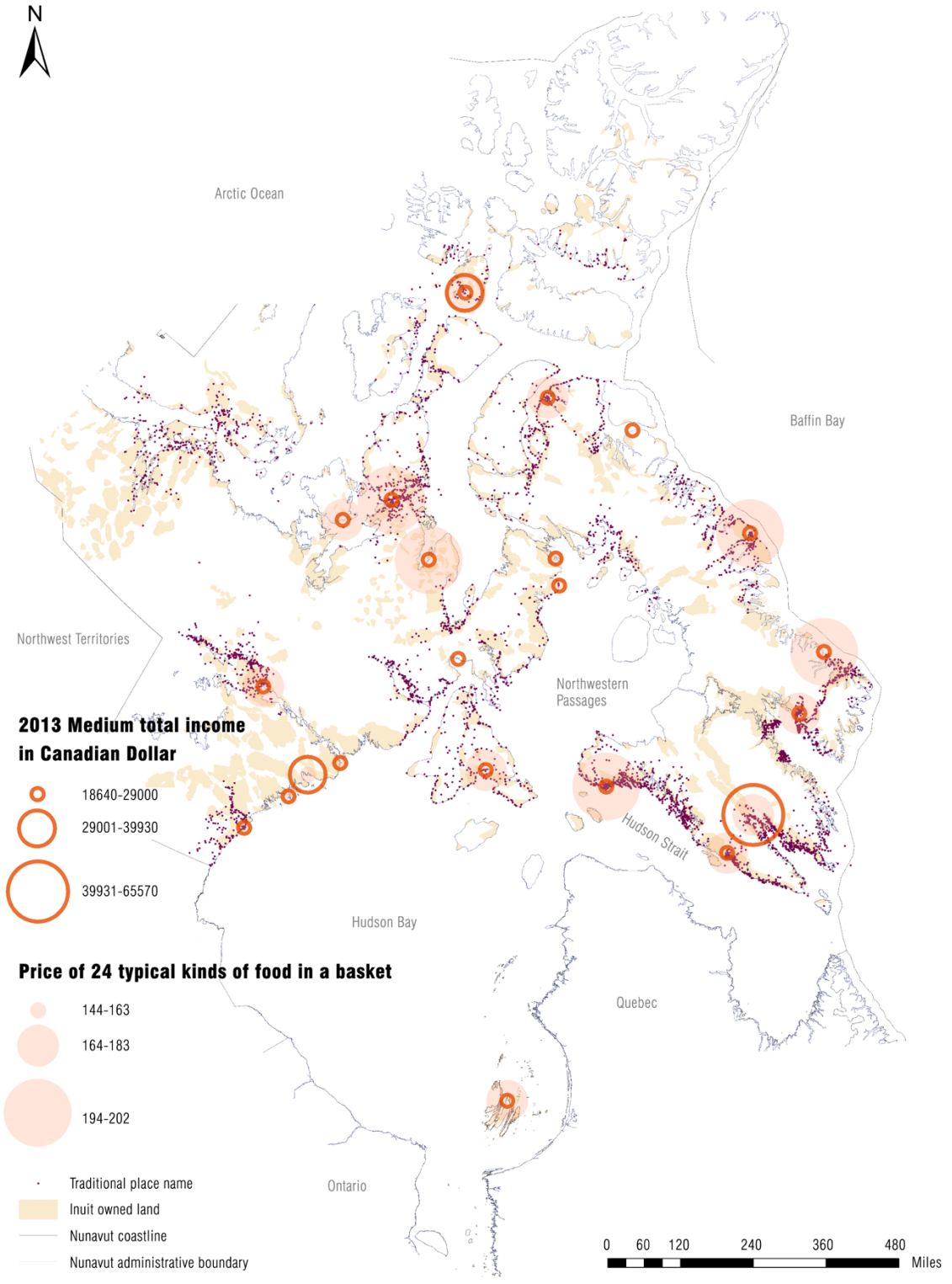


Figure 5 Most Nunavut communities are poor, with median total income below any other province in Canada (http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil108a-eng.htm). In the meanwhile, the food prices are too high to be affordable (edited by author, data source: Nunavut Median Total Income of Tax filers with Income by Region and Community, 1999 to 2013; Nunavut Food Price Survey, Comparison of 24 Select Food Items Basket, 2015-2016).

Proposed Vision

From nomadic camps to sedentary modern towns, the Inuit in the Canadian Arctic have been forced to adapt for many decades. The biggest challenge of this project is to understand their traditional culture in transition under the disruptions of technology and climate change. Because of these changes, there are generational gaps, and young Inuit today have only fragmented knowledge about traditional culture.

Many Inuit elders, thinking that place-based knowledge may not be sustained, have come a long way in documenting native place names so as to make them meaningful again to younger generations. They made a series of toponym maps to preserve a traditional way of thinking about landscape (**Figure 7**).

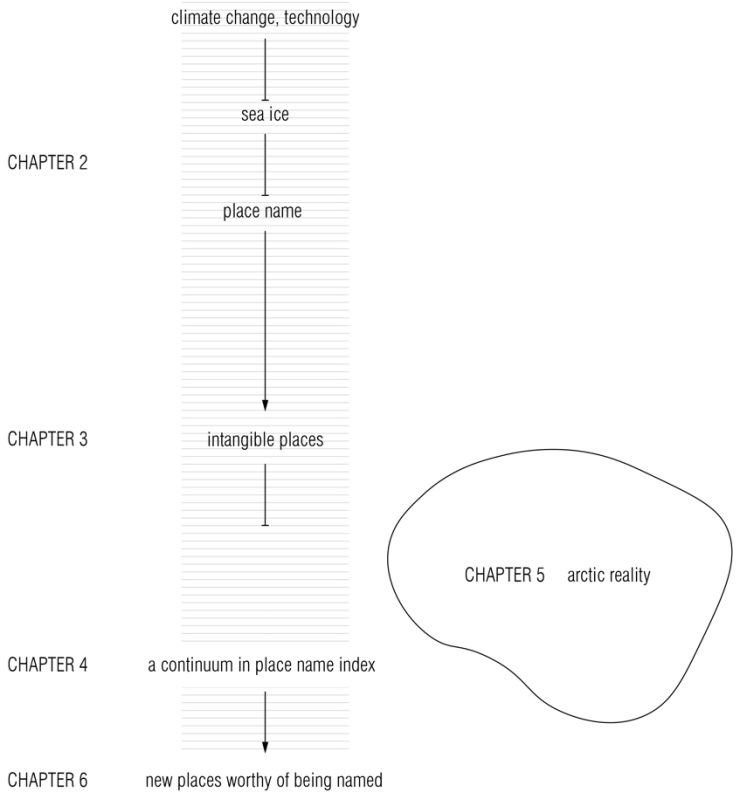


Figure 6 Vision of thesis

My thesis explores the relationship between climate change, technology, and place-naming among the Inuit of Nunavut (**Figure 6**). Seeing technological and climate change in continuity and synthesis instead of disruption will keep traditional place names alive and open opportunities for meaningful new names.

In this thesis, I have proposed six new places worthy of being named by the Inuit and added to their native index of place names.

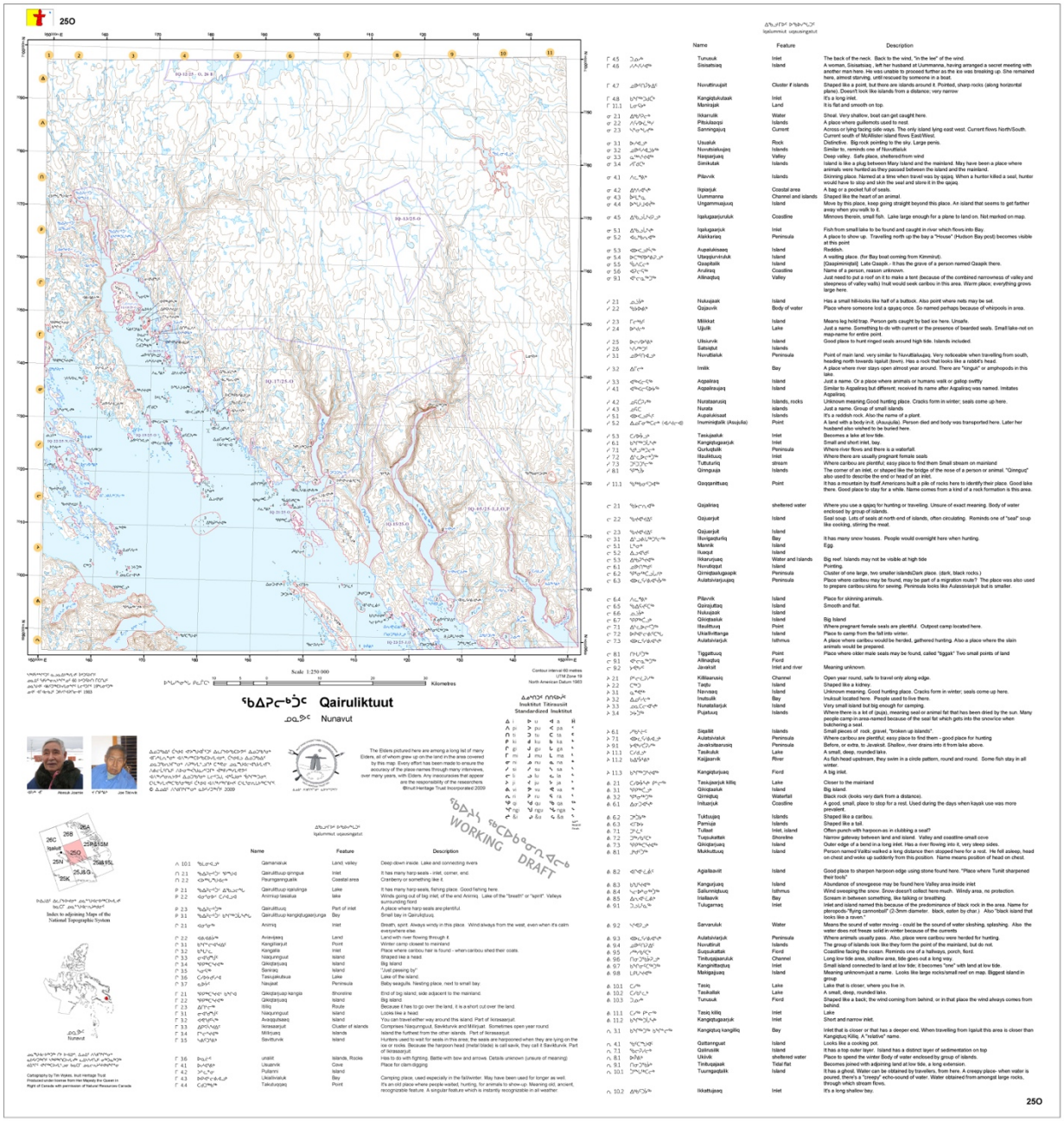


Figure 7 An example of traditional toponym maps made by elders working for Inuit Heritage Trust (map source: Qairuliktuut, Nunavut, IHT's Nunavut Map Series, http://ihti.ca/eng/place-names/pn-seri.html).

CHAPTER 2 PLACE NAME AND SEA ICE

Place Name

Toponymy (place naming) is a practice of landscape-that is, of negotiating the relationship between humans and nature, thus perpetuating cultural practice (**Figure 8**). Toponyms are guardians of Inuit memory, anchors of history, and aids for navigation (Whitridge 220). "Place-making" associated with toponyms in trackless icescape is key to Inuit spatiality and their cultural identity.

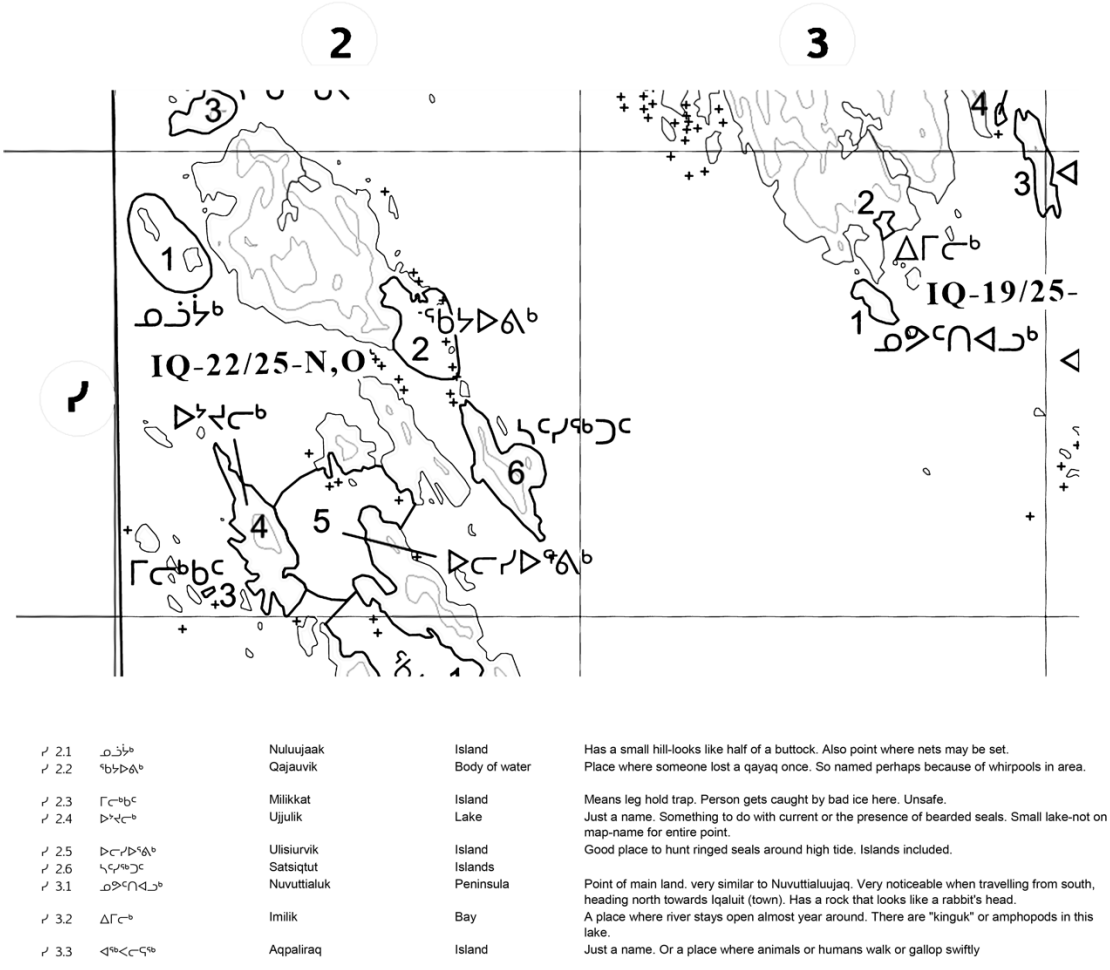


Figure 8 An example of zoomed-in traditional toponym maps made by elders working for Inuit Heritage Trust (Edited by author, map source: Qairuliktuut, Nunavut, IHT's Nunavut Map Series, http://ihti.ca/eng/place-names/pn-seri.html).

From prehistoric times, naming by the Inuit has been a gesture of marking, recognizing, or engaging natural flows in culturally significant sites (**Figure 9**). The names are not utilitarian. They do not

encapsulate objects in landscape, nor do they draw property boundaries. To name is to recognize a fact you value, to find meaningful information within; a fact only becomes a fact when it is claimed by who you are, by shared community efforts.

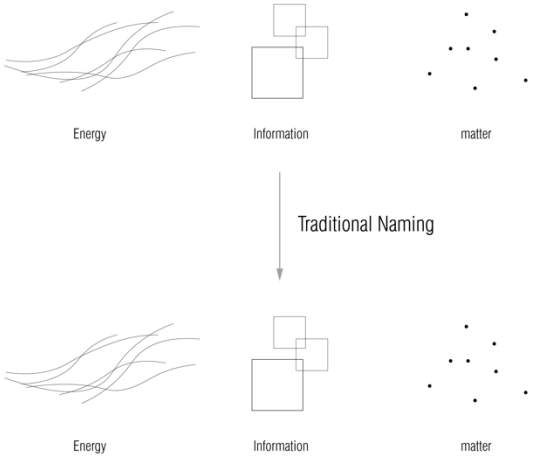


Figure 9 From prehistoric times, naming by Inuit has been a gesture of marking, recognizing, or engaging natural flows in culturally significant sites.

Sea Ice

While autumn in warmer areas of the world indicates everything being withered and the approaching of a lifeless end, autumn in the Arctic means freedom. It is usually the time when *siku*, the sea ice as the Inuit call it, is completely frozen and becomes an indistinguishable extension of the land (**Figure 10**). Sea ice is the Inuit seasonal "great networks of trails" (Krupnik et al. ix). It is the shortcut they take in winter. Traveling, hunting, fishing, recreational activities and sustaining social relationships in long arctic winters all revolve around sea ice.

Figure 10

a. Ocean water pocket in sea ice

b. Tidal movements cause uneven sea ice surface

Figure 10 (con.)

c. Ocean tides can still be very high in winter (sometimes 12-meter-high according to the local guide). Sea ice around islands is very unstable.

d. Local people think climate change is more about pattern change than just warming. The trails are harder than ever this year. Traveling takes more time and efforts. There are some missing people.

Figure 10 Sea ice photos and travel notes taken by author during her visit to Iqaluit in March 2017

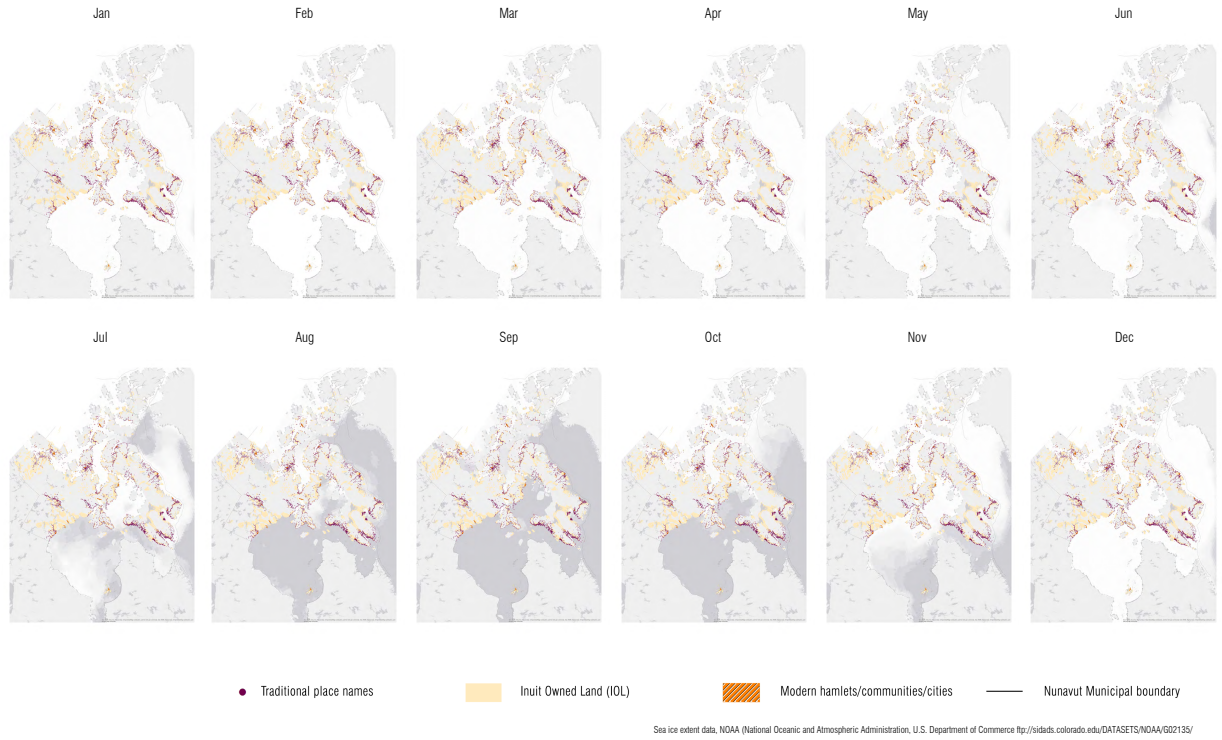
CHAPTER 3 INTANGIBLE PLACES

Sea ice in Nunavut has been vanishing since around the 1970s (**Figure 11**). Consequently, traditional named places are more and more seasonally inaccessible. Southern regions of Baffin Island are more severely affected by ice withdrawal. There are three approaches to visualize this inaccessibility: westernized scientific mapping, traditional Inuit mapping, and documenting typical practices at the floe edge.

Westernized Approach: Scientific Mappings

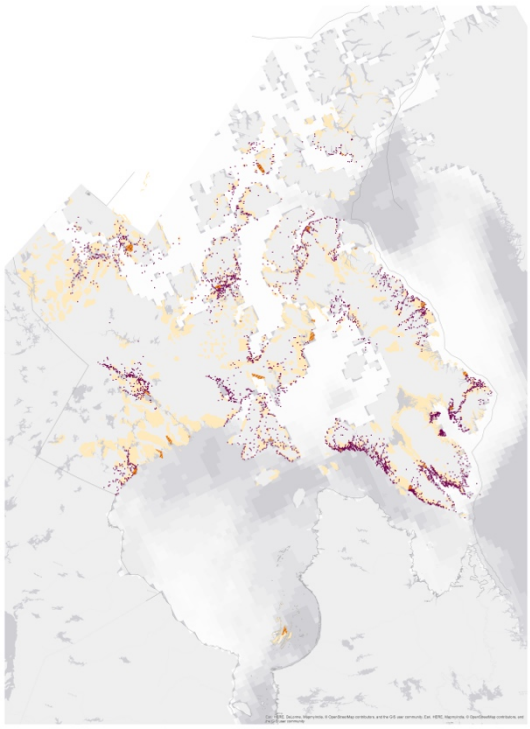
One approach is to compare the relationship between sea ice and named places in a three-generation period: G1(1965-1980) to current G3 (2000-2015) (**Figure 12, 13, 14**). These scientific maps visualize inaccessibility over different seasons (**Figure 15**). The objectiveness of these maps is represented by fixed appearances of shorelines and land features.

Figure 11

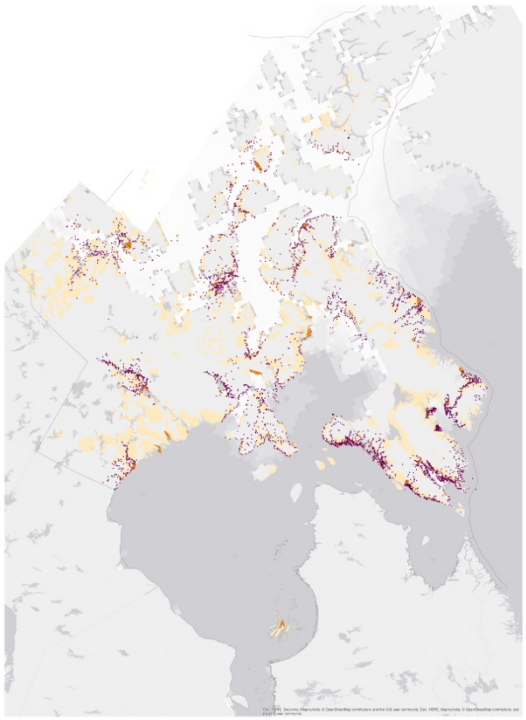


a. Monthly sea ice extent maps

Figure 11 (con.)



b. July sea ice extent



c. November sea ice extent

Figure 11 Sea ice has been vanishing from G1(transparent white, 1965-1980) to G3(solid white, 2000-2015) in Nunavut. Months in freezing and melting seasons demonstrate significant sea ice extent reduction (Edited by author, ArcGIS, data source: National Snow and Ice Data Center- Sea Ice Index Data and Image Archive- Monthly Sea Ice Extent and Area Data Files ftp://sidads.colorado.edu/DATASETS/NOAA/G02135/north/monthly/shapefiles/, Accessed Jan 18, 2017).

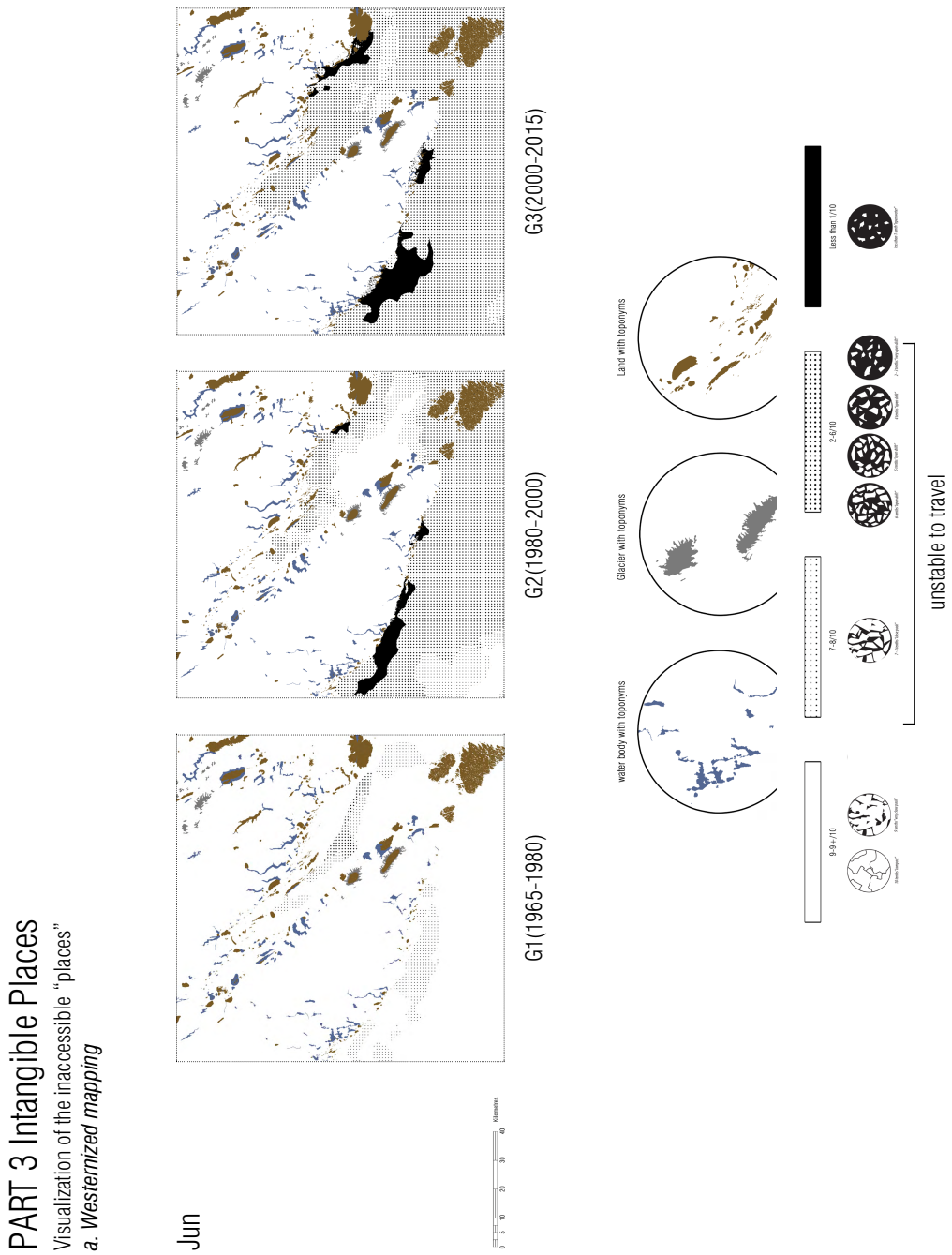


Figure 12 Westernized mapping series of Frobisher Bay-June. Mapping shows the spatially intertwined relationships of named terrains, water features, and sea ice over three generations. Patterns of mobility shift as climate changes (Projection: State Plane Coordinate System-Zone 19, data source: Calendar: Northern Canadian Waters - Median of Ice Concentration, http://iceweb1.cis.ec.gc.ca/30Atlas/page1.xhtml?grp=Guest&lang=en).

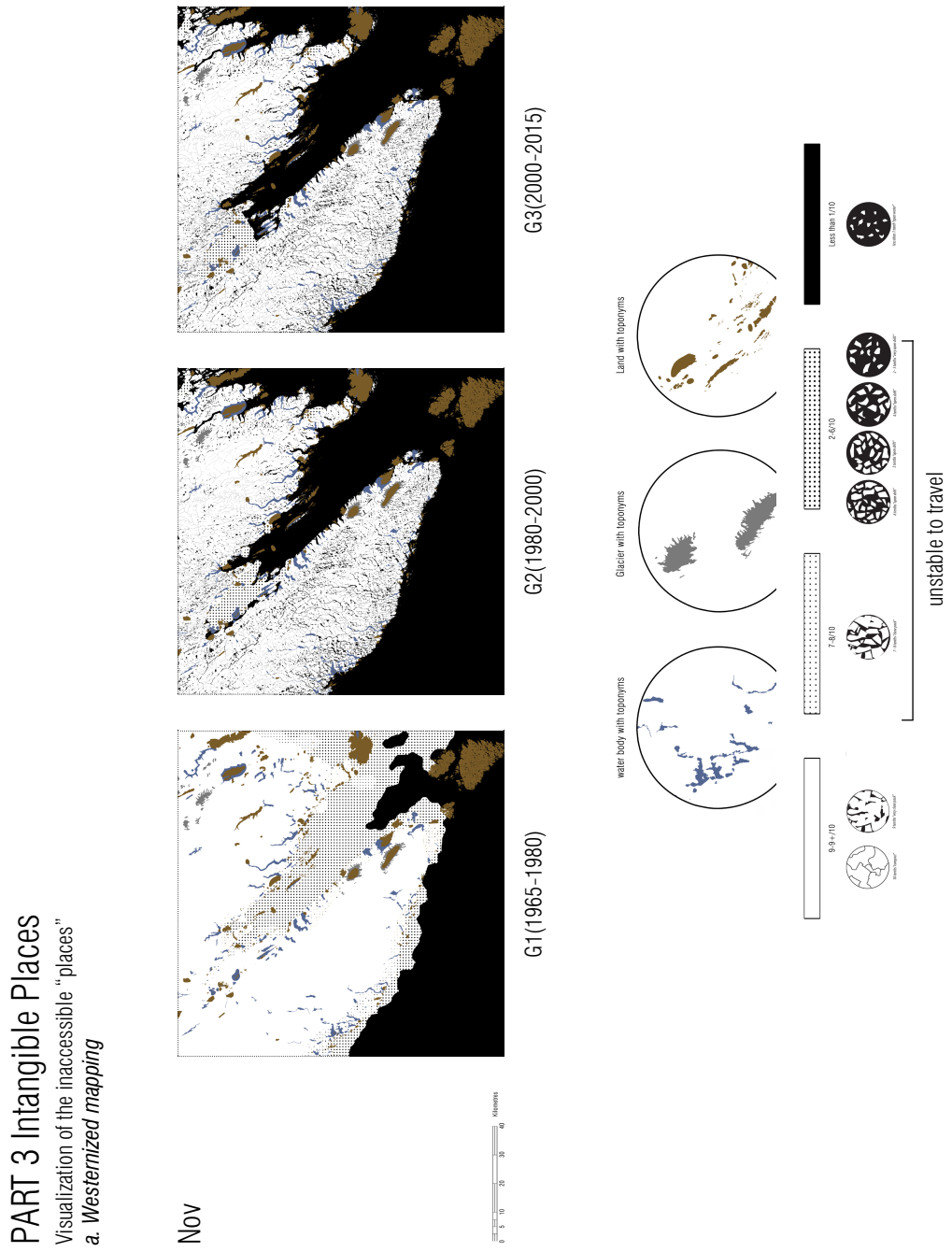


Figure 13 Westernized mapping series of Frobisher Bay-November. Mapping shows the spatially intertwined relationships of named terrains, water features, and sea ice over three generations. Patterns of mobility shift as climate changes (Projection: State Plane Coordinate System-Zone 19, data source: Calendar: Northern Canadian Waters - Median of Ice Concentration, http://iceweb1.cis.ec.gc.ca/30Atlas/page1.xhtml?grp=Guest&lang=en).

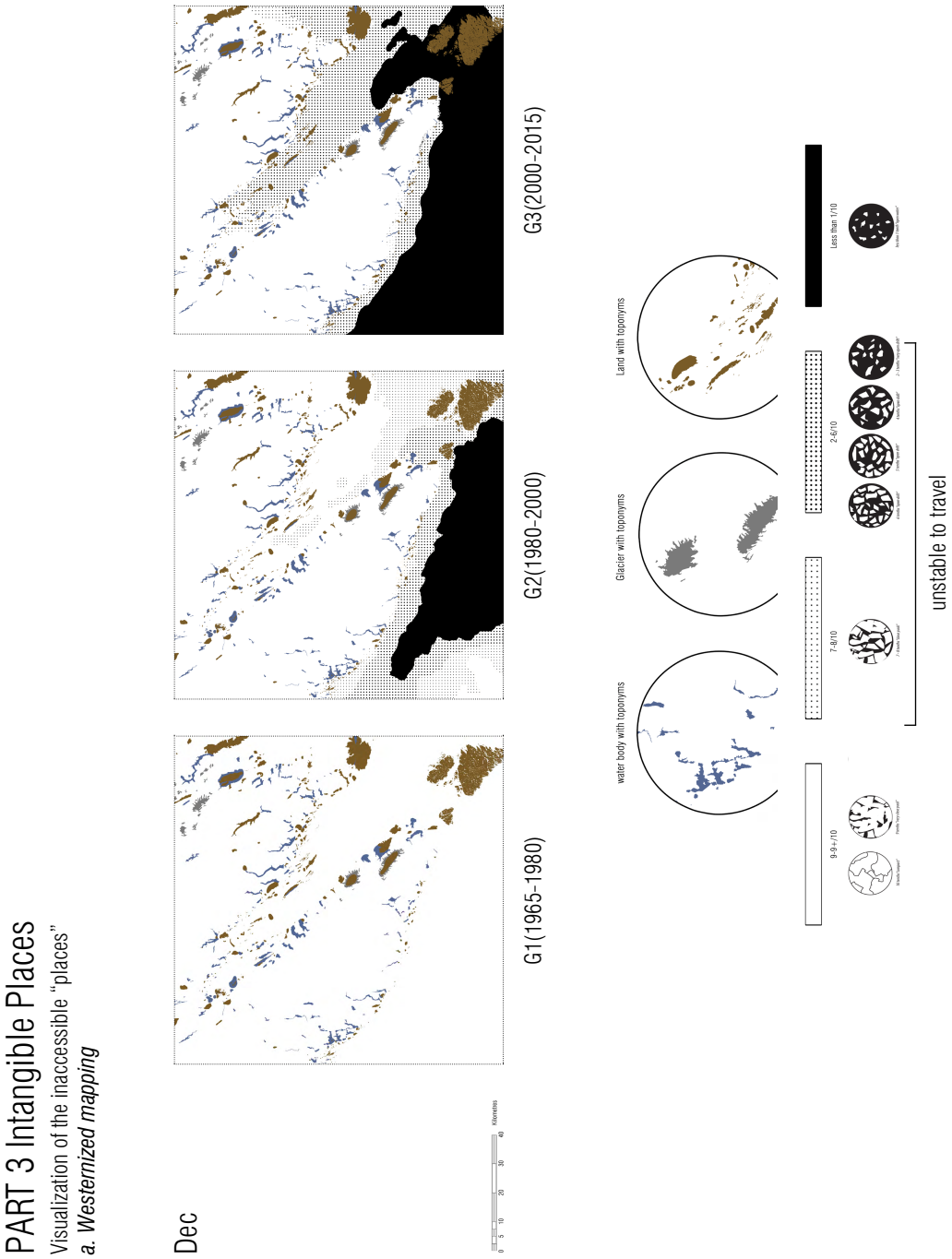


Figure 14 Westernized mapping series of Frobisher Bay-December. Mapping shows the spatially intertwined relationships of named terrains, water features, and sea ice over three generations. Patterns of mobility shift as climate changes (Projection: State Plane Coordinate System-Zone 19, data source: Calendar: Northern Canadian Waters - Median of Ice Concentration, http://iceweb1.cis.ec.gc.ca/30Atlas/page1.xhtml?grp=Guest&lang=en).

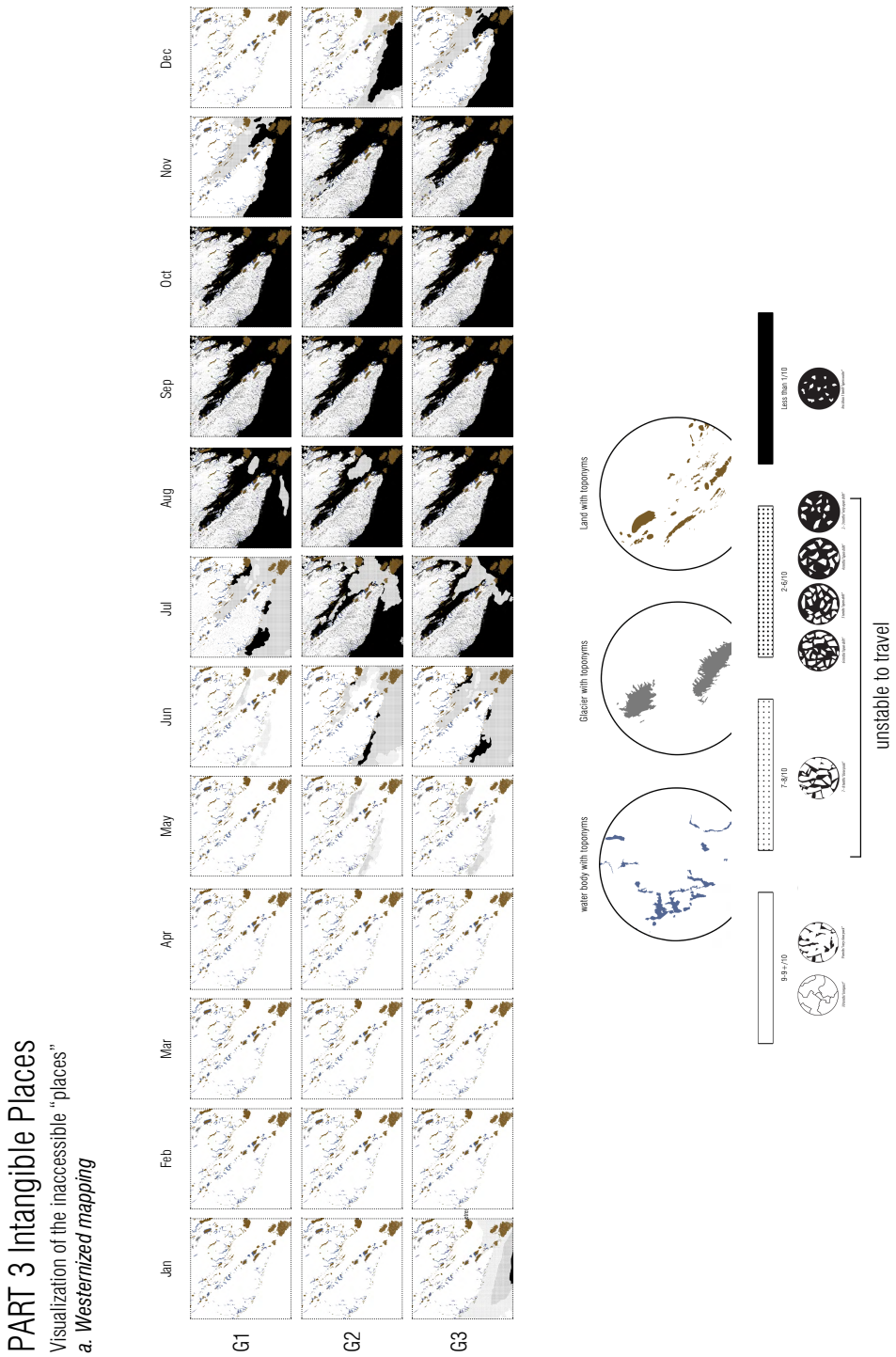


Figure 15 Westernized mapping series of Frobisher Bay. Mapping shows the spatially intertwined relationships of named terrains, water features, and sea ice over three generations. Patterns of mobility shift as climate changes (data source: Calendar: Northern Canadian Waters - Median of Ice Concentration, http://iceweb1.cis.ec.gc.ca/30Atlas/page1.xhtml?grp=Guest&lang=en).

Indigenous Approach: Inuit Tactile Maps

The second approach to visualizing seasonal inaccessibility is to modify Inuit tactile maps according to sea ice vanishing patterns. This approach embodies interactions with landscape onto maps.

Using maps to orient themselves and aid memories is not new for the Inuit. The most widely acknowledged aspect of Inuit ethnography is their adoption of physical maps and navigational markers to delineate local topography and travel trails in an abstract way (Whitridge 222). Whitridge pointed out that "the objectification of spatial relationships in the form of a physical map, however temporary, was a traditional mode of the Inuit relationship to place" (Whitridge 223). Today, researchers have found that maps are prominent study tools for attaining Inuit's understanding about their environment. This is especially due to the maps' potentials to spark memories, promote information exchanges, and effectively present different observations in both visual and spatial modes (Laidler et al. 48). In the Inuit traditional cartography, people straightened the meandering coastal journey and used an abstract way to depict their mental map of islands and water bodies (Fredskild 171) (**Figure 17**).

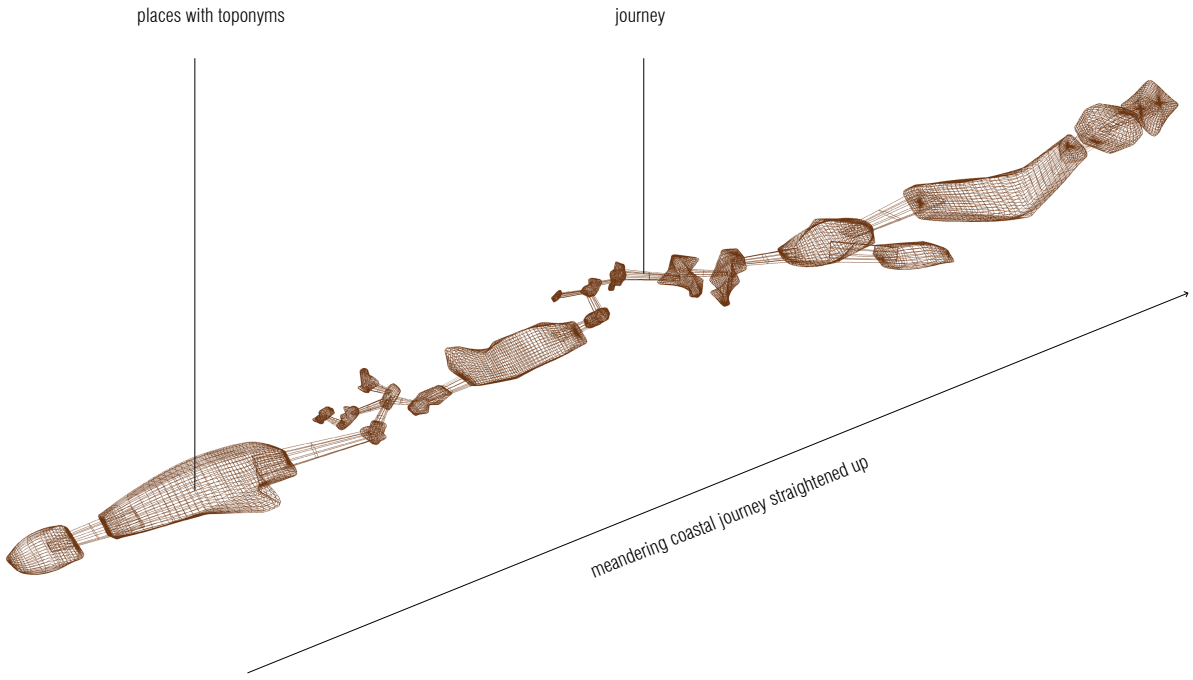
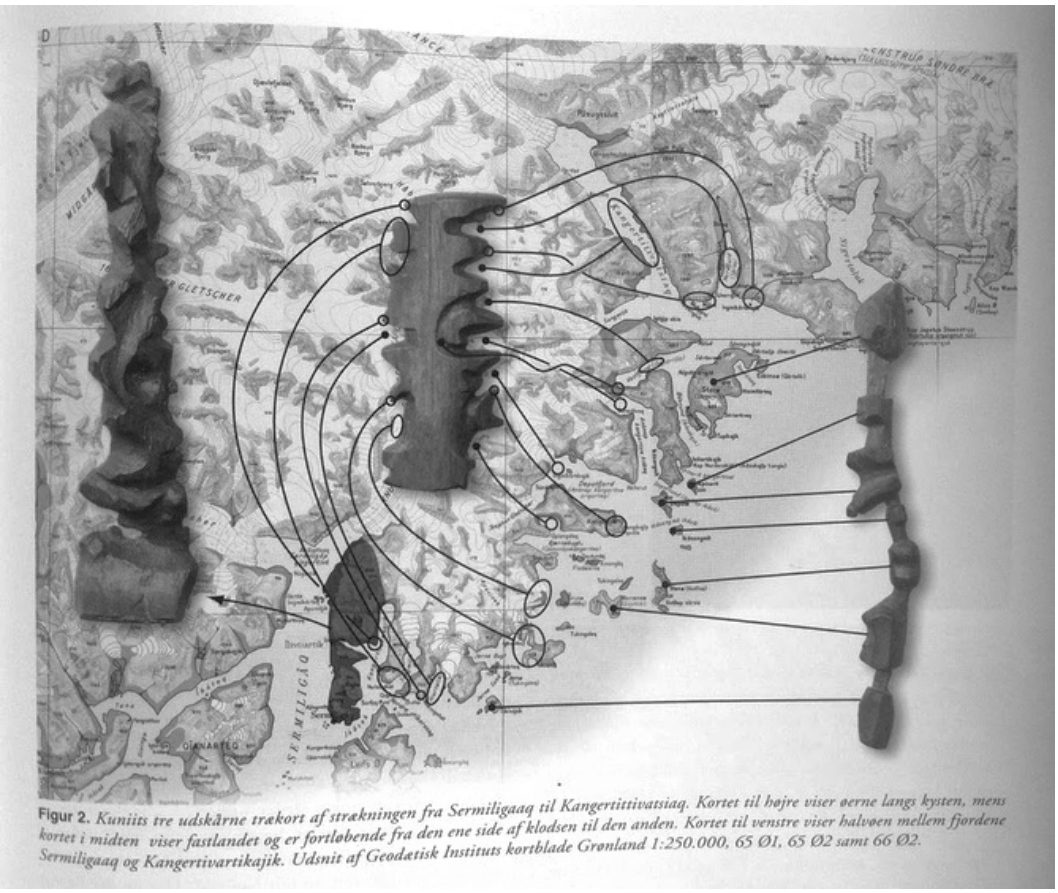


Figure 16 Based on the logic of Inuit traditional cartography, imaginative tactile maps the Inuit would bring with them in different seasons are designed. Current considerations of vanishing sea ice are added, and only the places with toponyms are drawn. The new maps are also designed to be crafted wooden tactile maps of human empirical scale.



Figur 2. *Kuniits tre udskårne trækort af strækningen fra Sermiligaaq til Kangertittivatsiaq. Kortet til højre viser øerne langs kysten, mens kortet i midten viser fastlandet og er fortløbende fra den ene side af klodsen til den anden. Kortet til venstre viser halvøen mellem fjordene Sermiligaaq og Kangertivartikajik. Udsnit af Geodætisk Instituts kortblade Grønland 1:250.000, 65 Ø1, 65 Ø2 samt 66 Ø2.*

Figure 17 These handheld maps of Greenland show the intimacy between the Inuit and their landscape. In English, the caption reads: "Kuniit's three wooden (tree) maps show the journey from Sermiligaaq to Kangertittivatsiaq. Map to the right shows the islands along the coast, while the map in the middle shows the mainland and is read from one side of the block around to the other. Map to the left shows the peninsula between the fjords Sermiligaaq and Kangertivartikajik." From "Topografisk Atlas Grønland," published by Det Kongeglige Danske Geografiske Selskab, 2000 (pg 171).

In modifying traditional Inuit maps, current considerations of vanishing sea ice are added, and only places with toponyms are drawn. The new maps are also designed to be crafted wooden tactile maps of human empirical scale (**Figure 16**). They are designed to travel with the Inuit inside their mittens, whether on a sunny spring day or in winter darkness. They will help the Inuit detour to avoid unstable and dangerous ice in transitional seasons (**Figure 18**). Maps for traveling on ice are shorter (which means more time-saving) than those for traveling by water. The inaccessible places-those that mentally disappear-with-sea-ice are missing from the maps. They are no longer tangible, unlike their fixed points or skeletal outlines on westernized scientific maps.

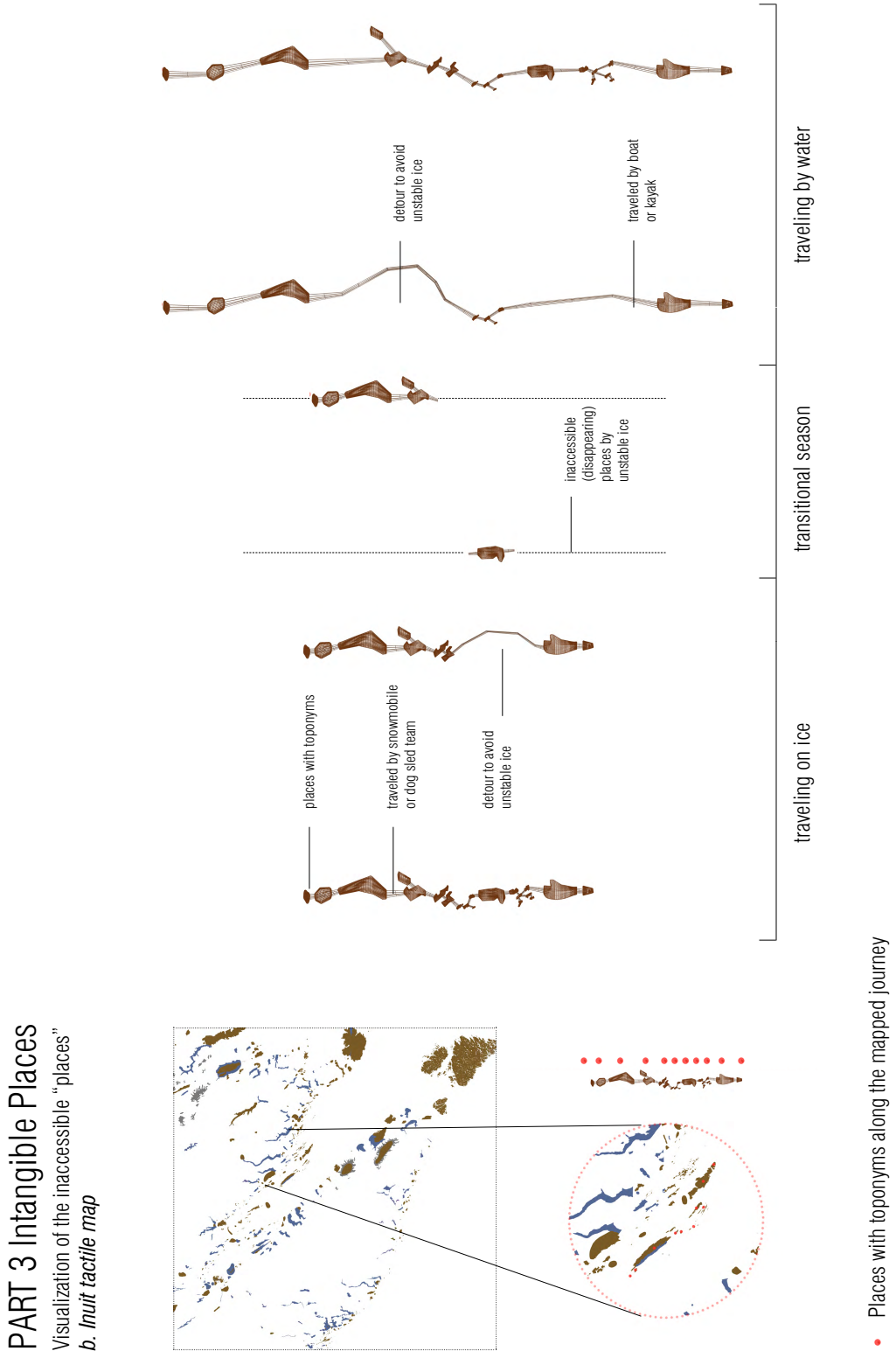


Figure 18 These maps are designed to travel with the Inuit inside their mittens, whether on a sunny spring day or in winter darkness. They help the Inuit detour to avoid unstable and dangerous ice in transitional seasons.

These tactile maps can also be used to show seasonal variations over different generations (**Figure 20, 21, 22, 23, 24, 25,26**). Dramatic climate changes started when G1 transitioned to G2 (around the 1980s), as is shown by the comparison of two pairs of maps (**Figure 19**).

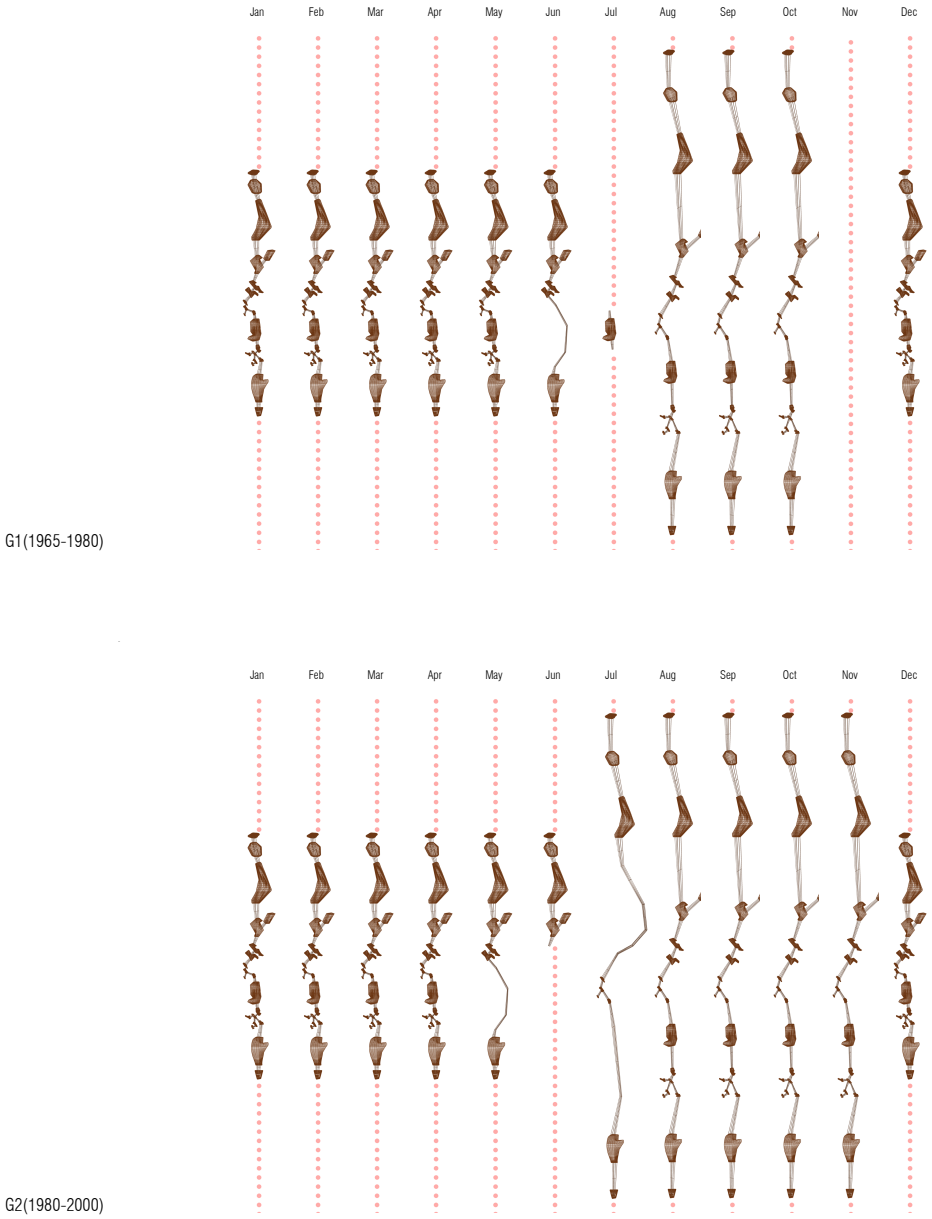


Figure 19 These tactile maps change significantly in different seasons and over generations.

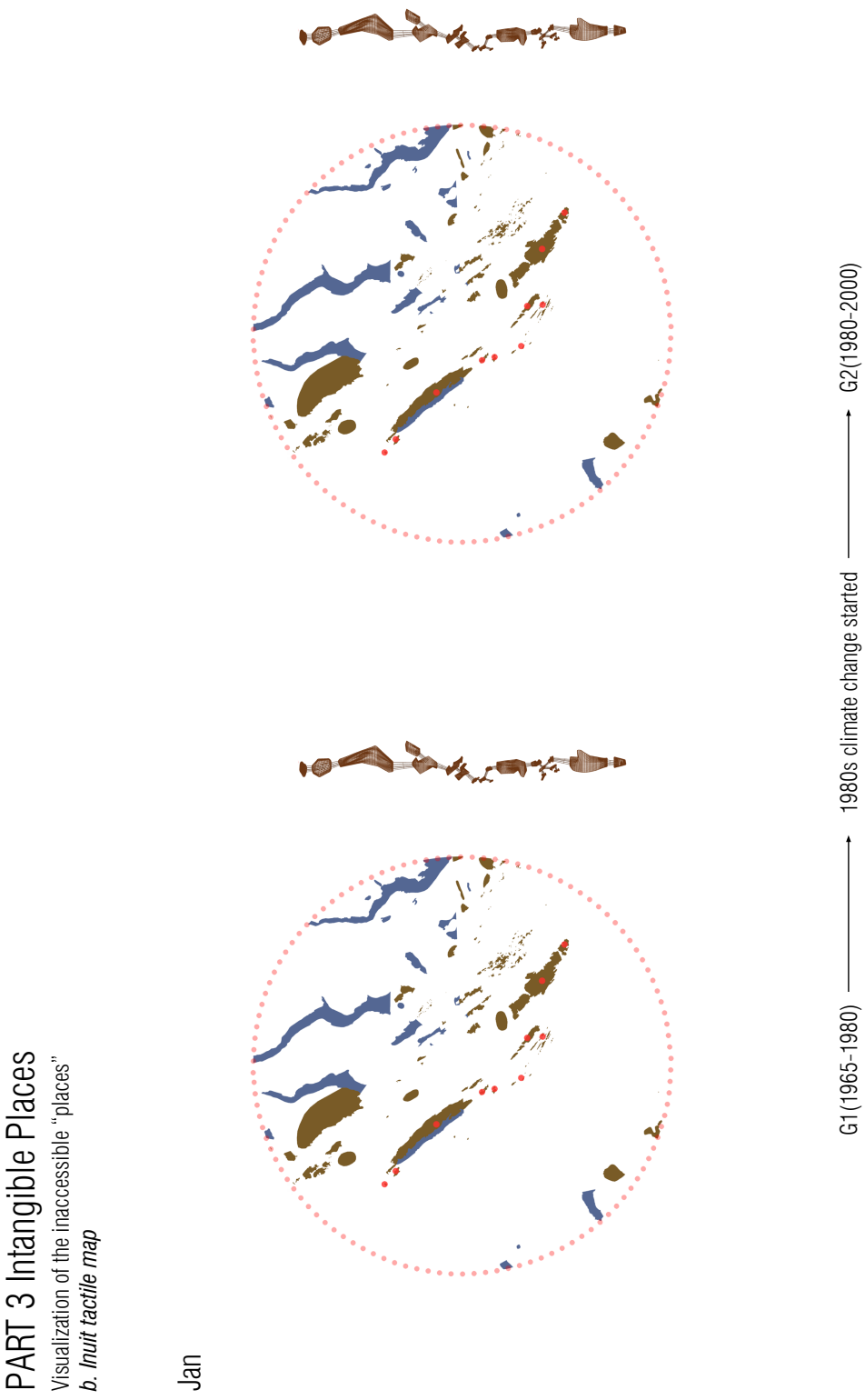


Figure 20 These tactile maps can also be used to show seasonal variations over different generations-January.

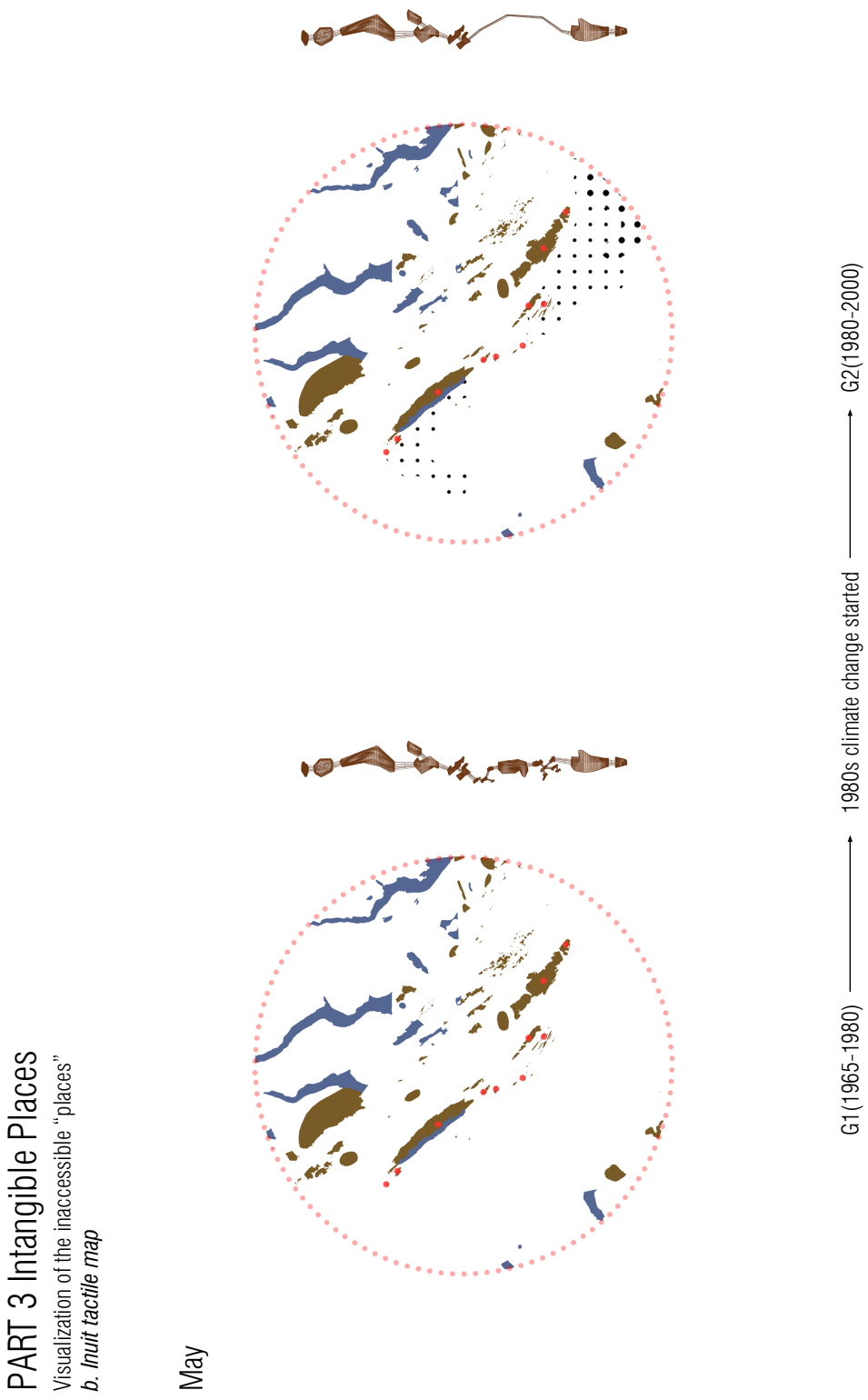


Figure 21 These tactile maps can also be used to show seasonal variations over different generations-May.

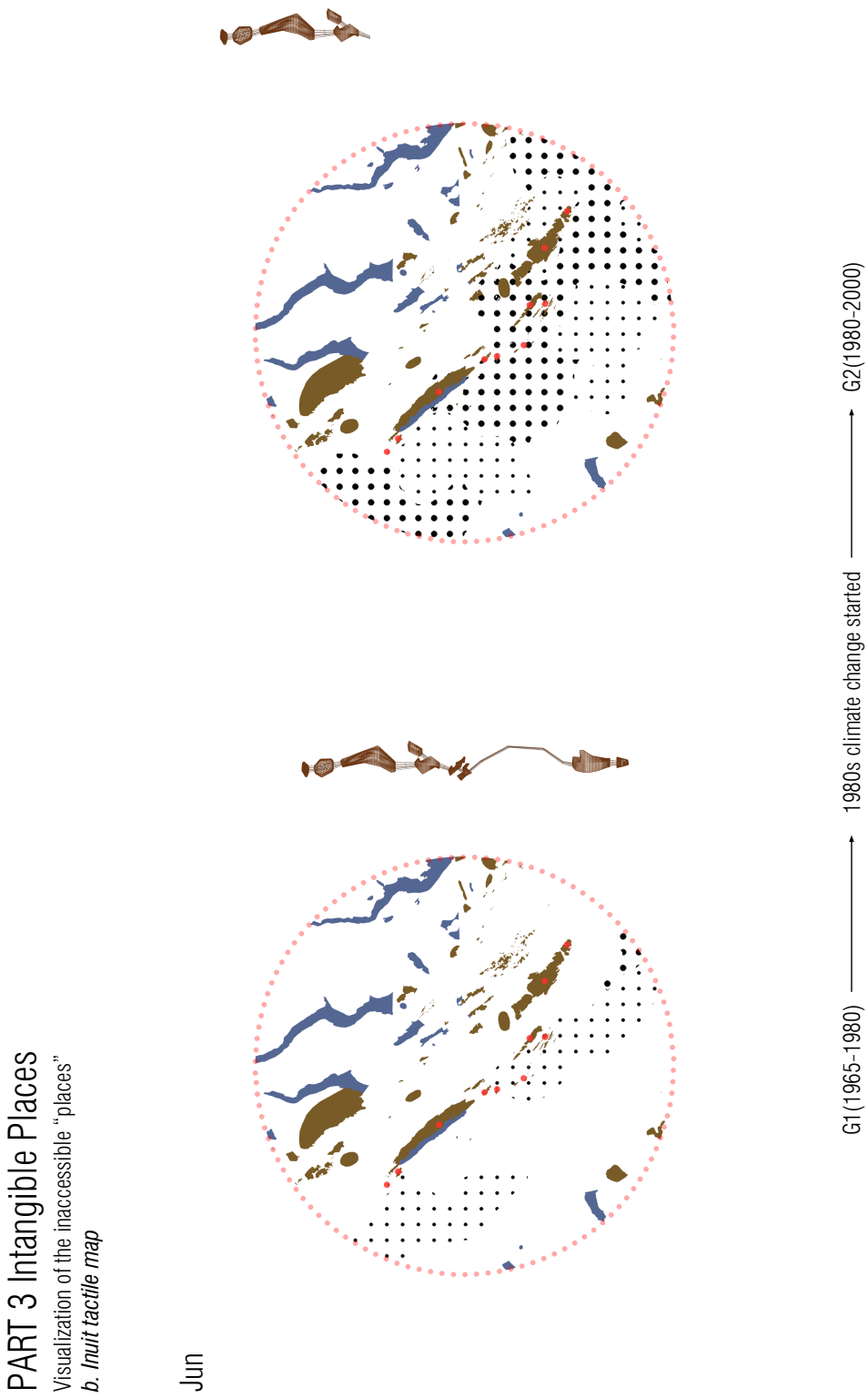


Figure 22 These tactile maps can also be used to show seasonal variations over different generations-June.

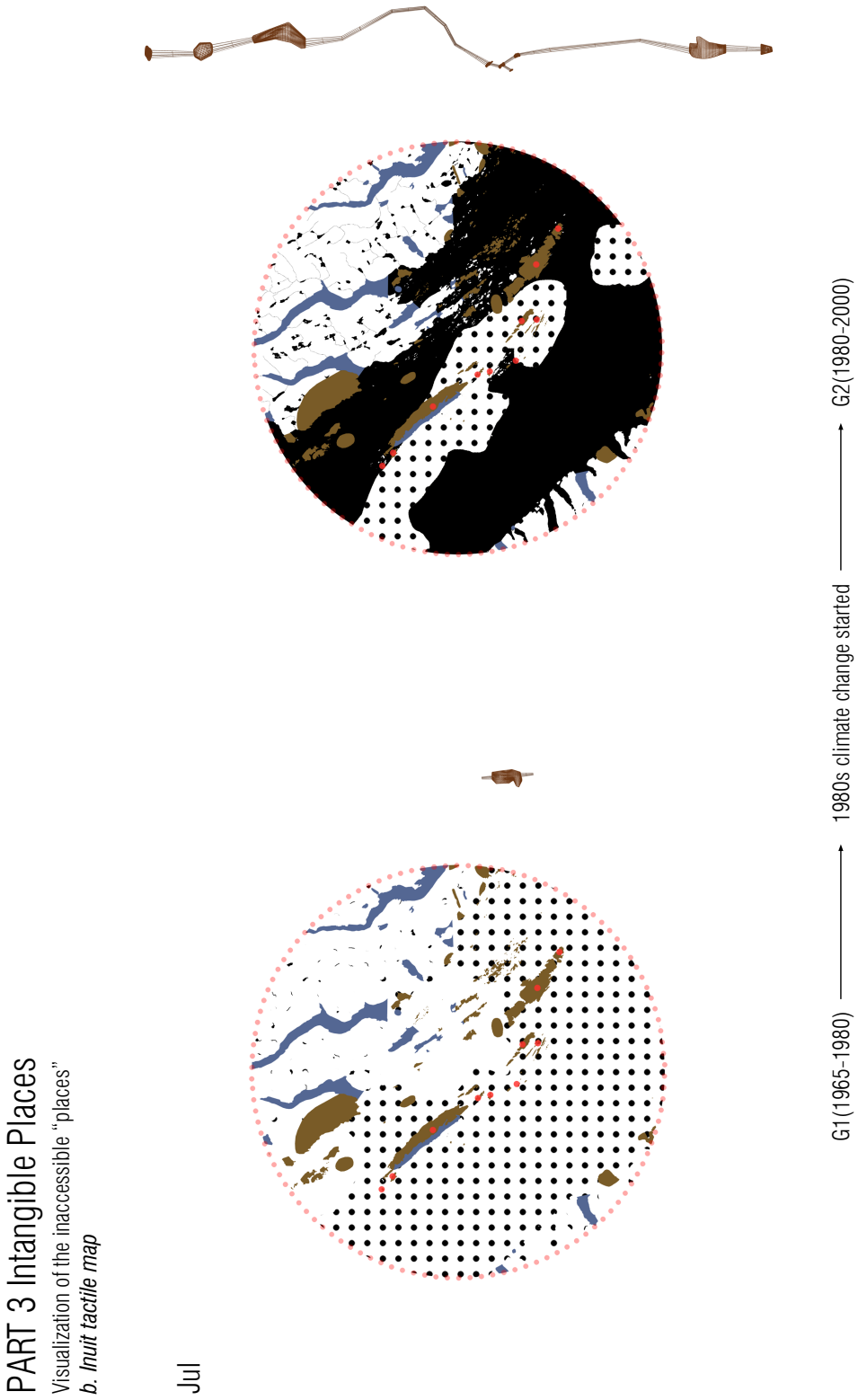


Figure 23 These tactile maps can also be used to show seasonal variations over different generations-July.

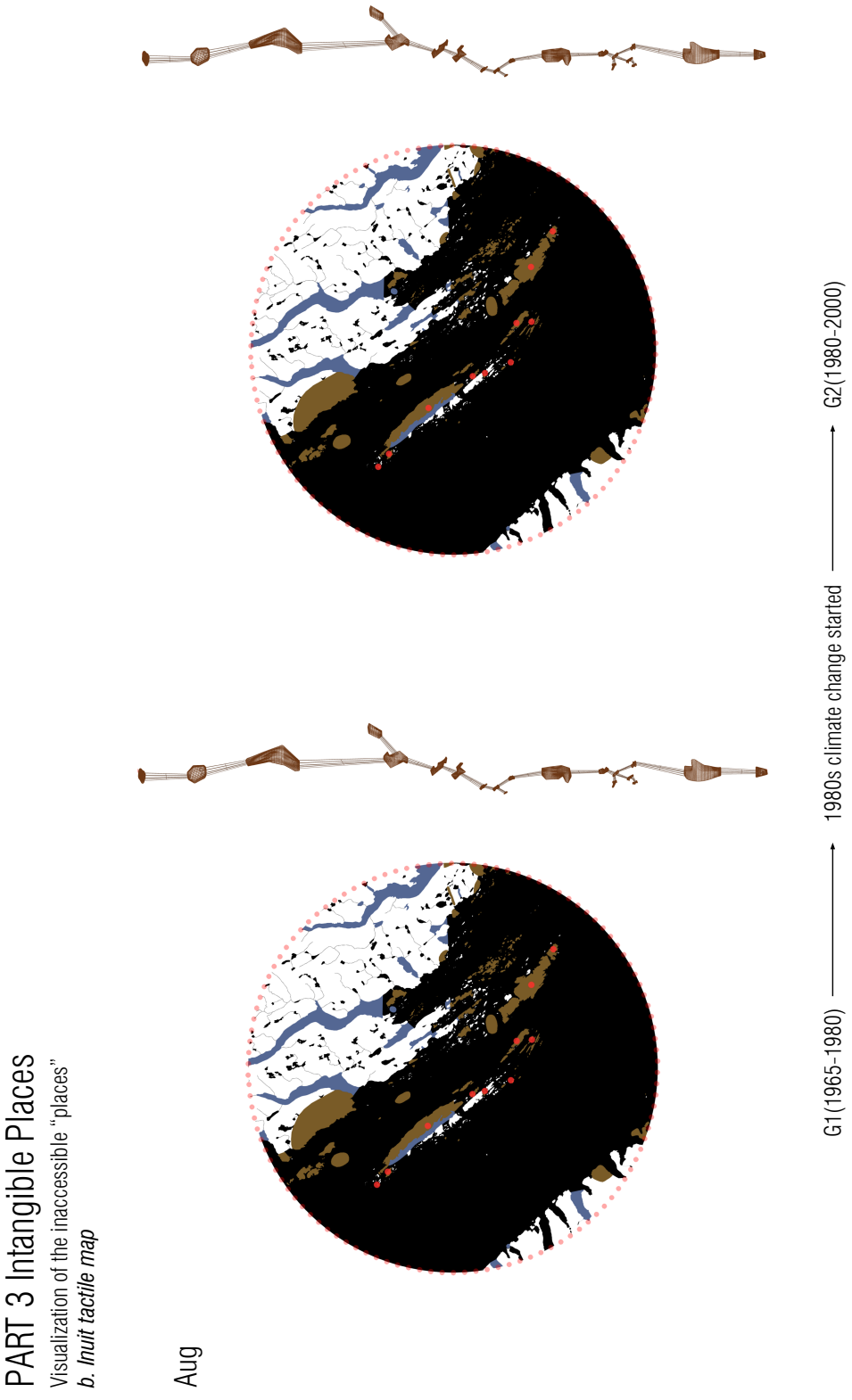


Figure 24 These tactile maps can also be used to show seasonal variations over different generations-August.

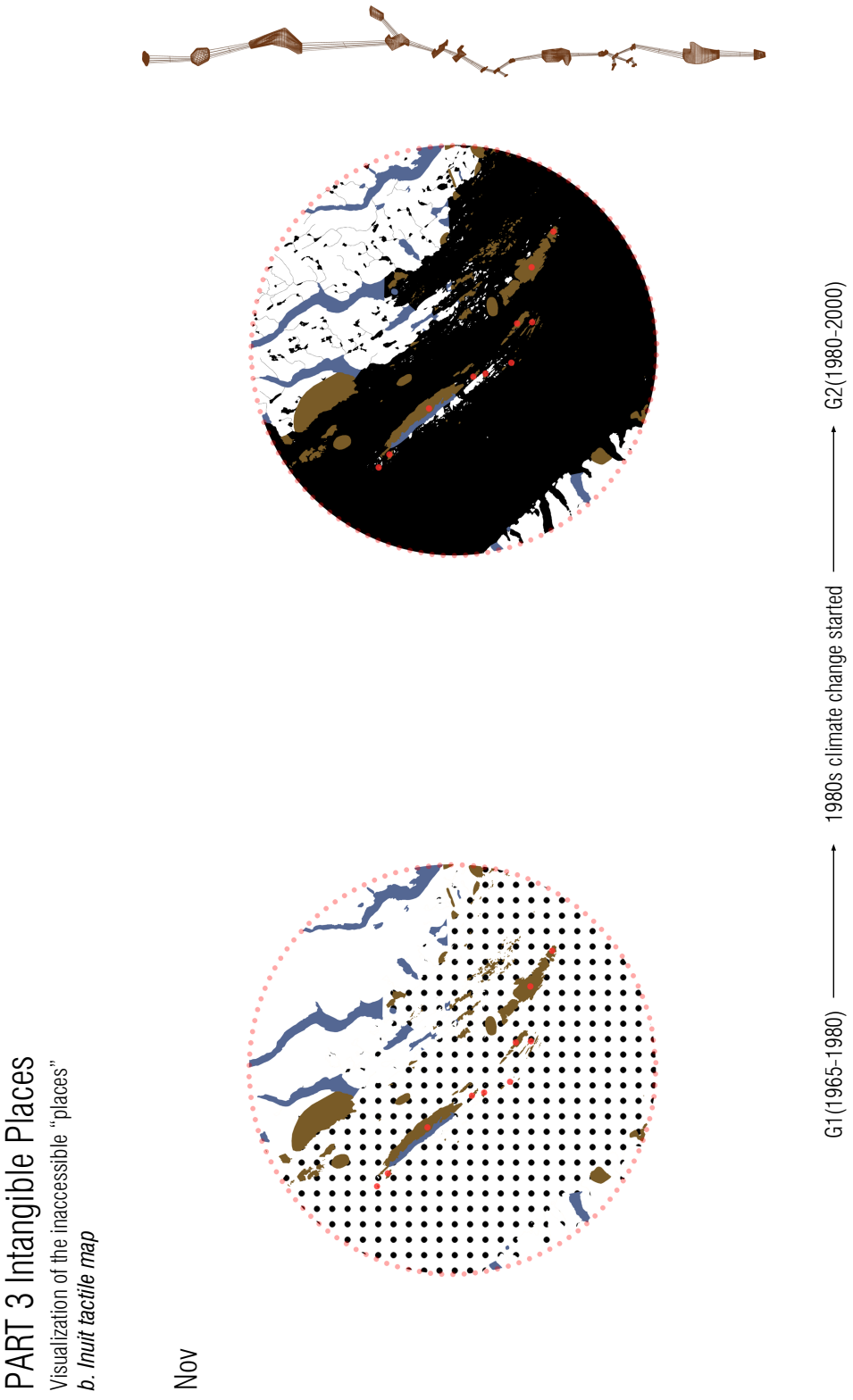


Figure 25 These tactile maps can also be used to show seasonal variations over different generations-November.

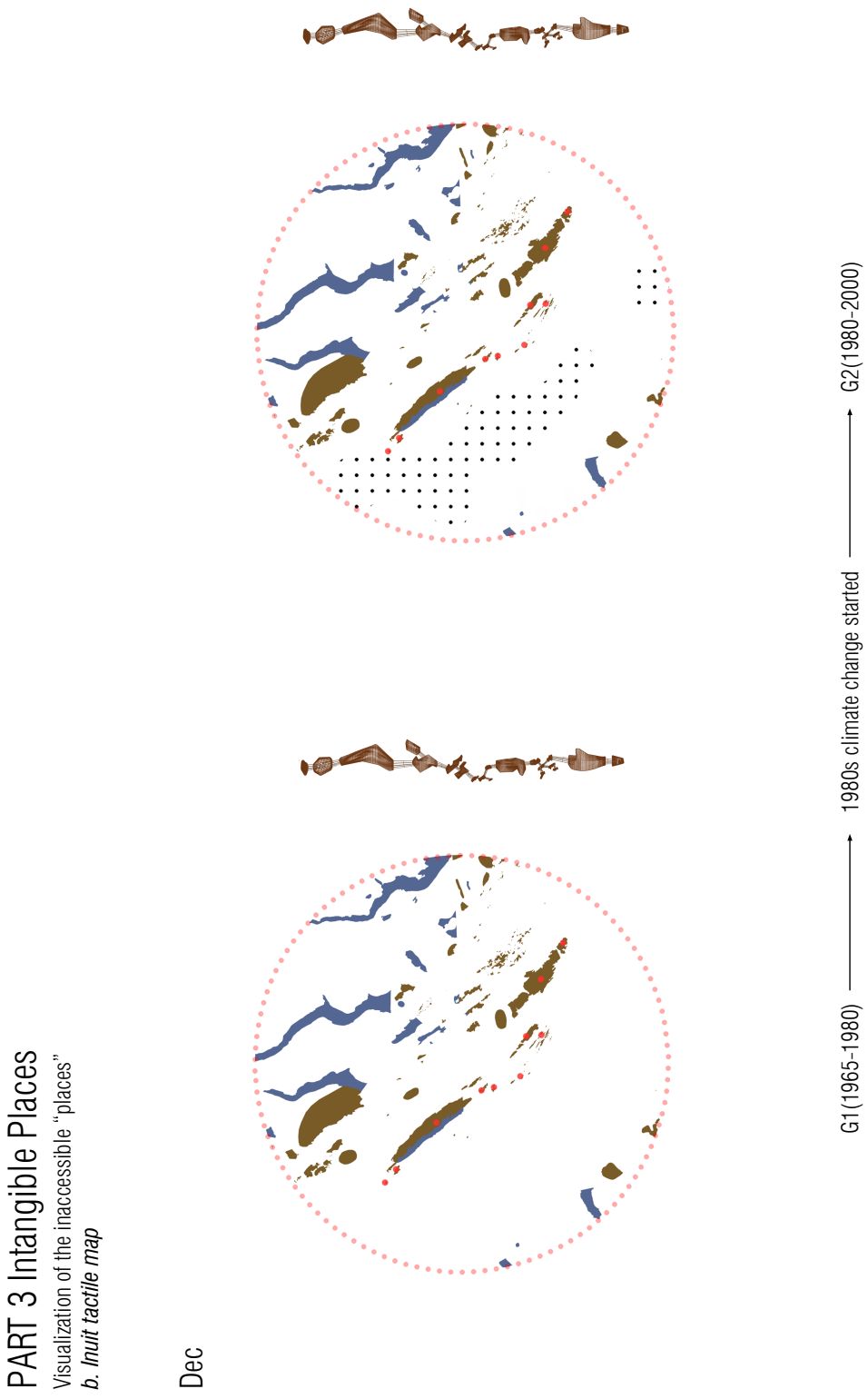


Figure 26 These tactile maps can also be used to show seasonal variations over different generations-December.

Design Research Approach: Practices at the Floe Edge

Floe edge is the interface where sea ice extends from land and meets water (**Figure 27**). Most Inuit activities associated with survival, such as seal hunting, are located within this seasonal ecotone (**Figure 28**). However, it is now becoming fragmented, easily breaking off and therefore unpredictable. These changes have led to inconvenience and dangers of Inuit lives as well as to complications for wildlife (Laidler et al. 377).

Figure 27 Floe edge is the interface where sea ice extends from land and meets water.
Most Inuit activities associated with survival, such as seal hunting, are located within this seasonal ecotone (image source: http://arcticjournal.ca/forty-below-traditional-life-in-the-arctic/; https://www.pinterest.com/pin/14284923795913312/).

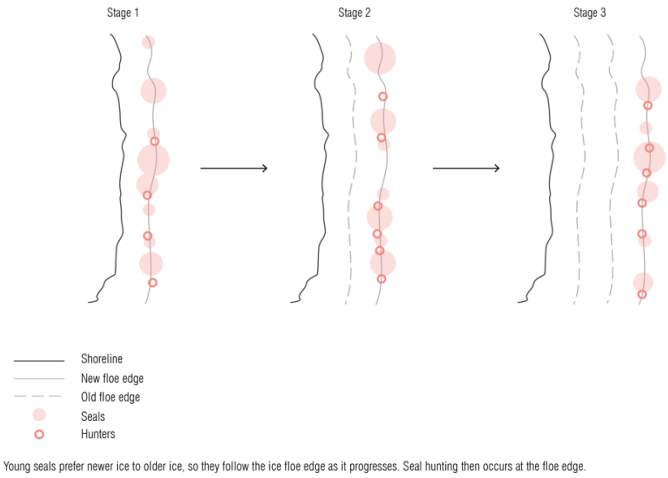


Figure 28 Young seals prefer newer ice to older ice, so they follow the ice edge as it progresses. Seal hunting then occurs at the floe edge.

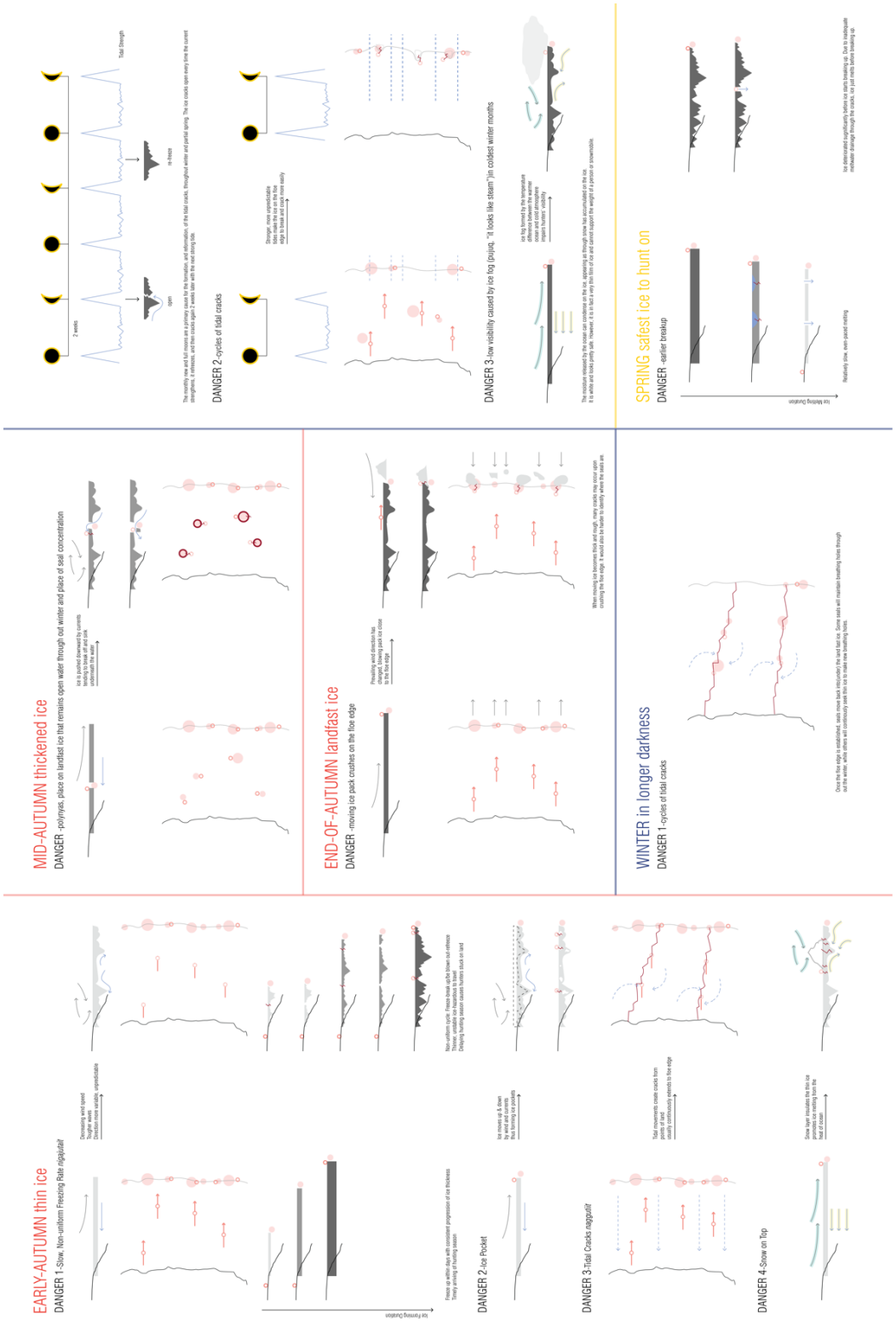


Figure 29 Sea ice abnormal dynamics over different seasons under Climate Change (edited by author, phenomenon descriptions reference: Laidler, Gita J., et al. "Travelling and hunting in a changing Arctic: assessing Inuit vulnerability to sea ice change in Igloolik, Nunavut." Climatic change 94.3 (2009): 363-397.).

The most significant changes to floe edge from G1 to G3 (Laidler et al. 379) include the following:

1. Longer durations of open water seasons
2. Higher temperatures, so more snow, less ice
3. Delayed freezing with longer transitional periods (0.7 days/year)
4. Early melting with longer transitional periods (0.6 days/year)

CHAPTER 4 A CONTINUUM IN PLACE NAME INDEX

Just as sea ice has become unstable, Inuit people have been relocated from seasonal camps to modern towns, where new kinds of communication, transportation, and other technologies proliferate (**Figure 30**). The Inuit are no longer nomads who traverse vast arctic land.

a. A traditional hunter with bow and arrow b. A modern hunter with gun and snowmobile (skidoo)

Figure 30 Inuit people have been relocated from seasonal camps to modern towns, where new kinds of communication, transportation, and other technologies proliferate (Image source: http://firstpeoplesofcanada.com/fp_groups/fp_inuit3.html; http://frankkuin.com/en/2007/05/03/inuit-seal-hunt/).

An Ecological Continuum

Normally, the introduction of capitalism and technology into a traditional society is conceived as a break from the past (**Figure 31**) and people in traditional societies are passive victims. However, it can also be seen as a continuum (**Figure 32**). Seen from an ecological monism viewpoint (Bennett 111-122) or mechanical way, they are flows of energy, information, and matter.

For example, many modern backyards in Wemindji, Québec, have modified *tipis* for cooking, which demonstrates the blurry distinction between tradition and modernity (Eades 4). *Tipis* are traditional camping structures that signifies occupancy (information). They house oil lamps (energy) as well as provide space for tool storage and food preparation (matter).

Figure 31 Normally, the introduction of capitalism and technology into a traditional society is conceived as a break from the past.

Figure 32 However, it can also be seen as a continuum. Seeing from an ecological viewpoint, they are flows of energy, information, and matter. Edited by author.

Distribution and Meanings of Toponymy

Scales and patterns of place names are very different among human generations (from G1 to G3). However, both traditional place names and their contemporary counterparts are responsive negotiations between Inuit lives and the arctic landscape. By comparing the distribution and meanings of toponyms (**Figure 33**), a consistency was found between traditional and modern place names in the place name index (6 sub-indexes, **Figure 34**).

The contents of toponyms indicate that negotiation between Inuit lives and the arctic landscape, such as cultural practices, food, and navigation, have undergone acute or chronic cultural, technological, and climatic changes as a continuous and responsive process. For example, practices at the floe edge have shifted from unmediated labor to technological operations (**Figure 35**).

However, these changes are still significant enough that elders worried about channelizing this continuity into new generations, so they made the toponymy maps shown earlier.

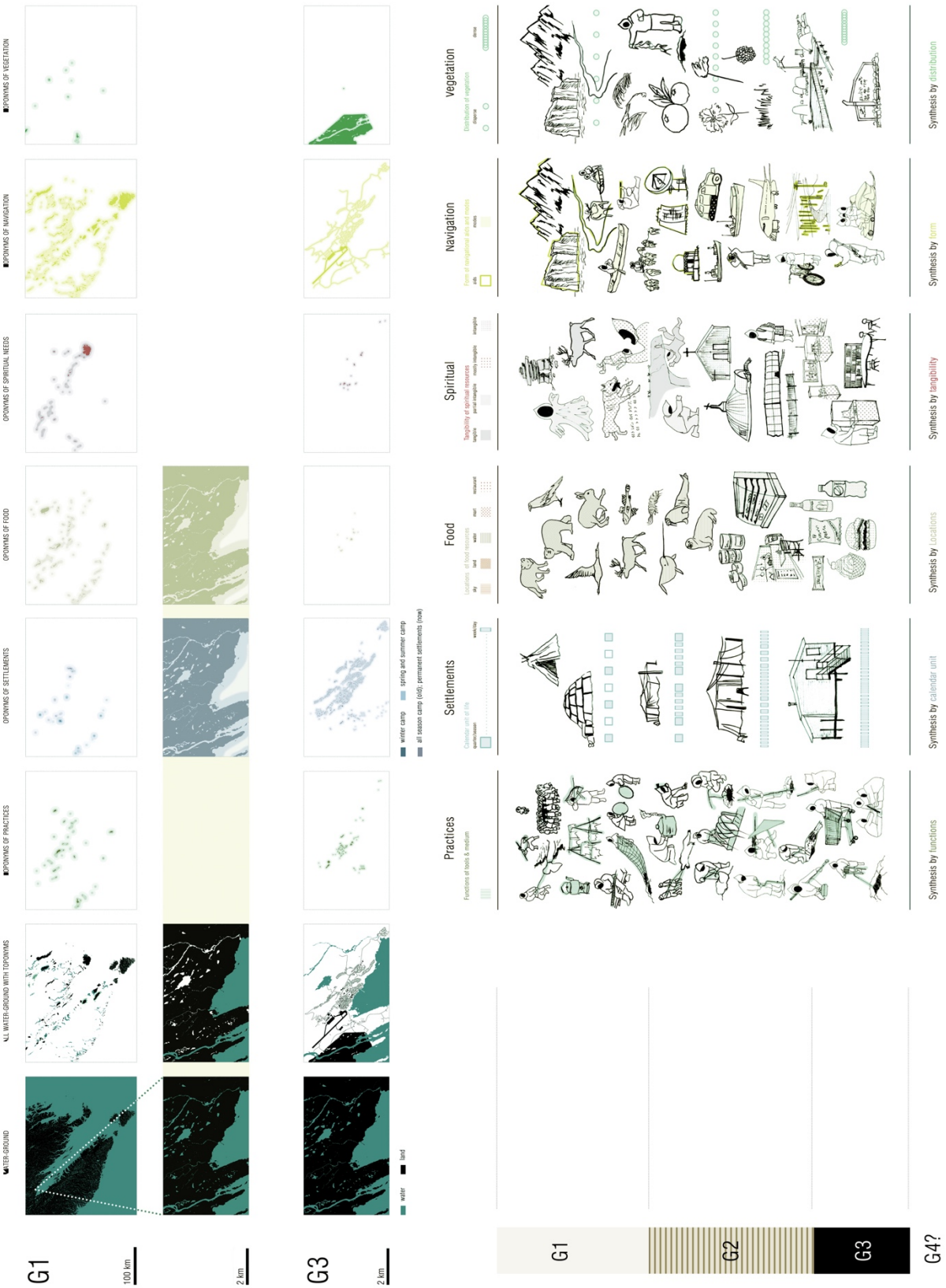


Figure 33 Distribution and meanings of toponyms over three generations (G1-G3). Edited by author.

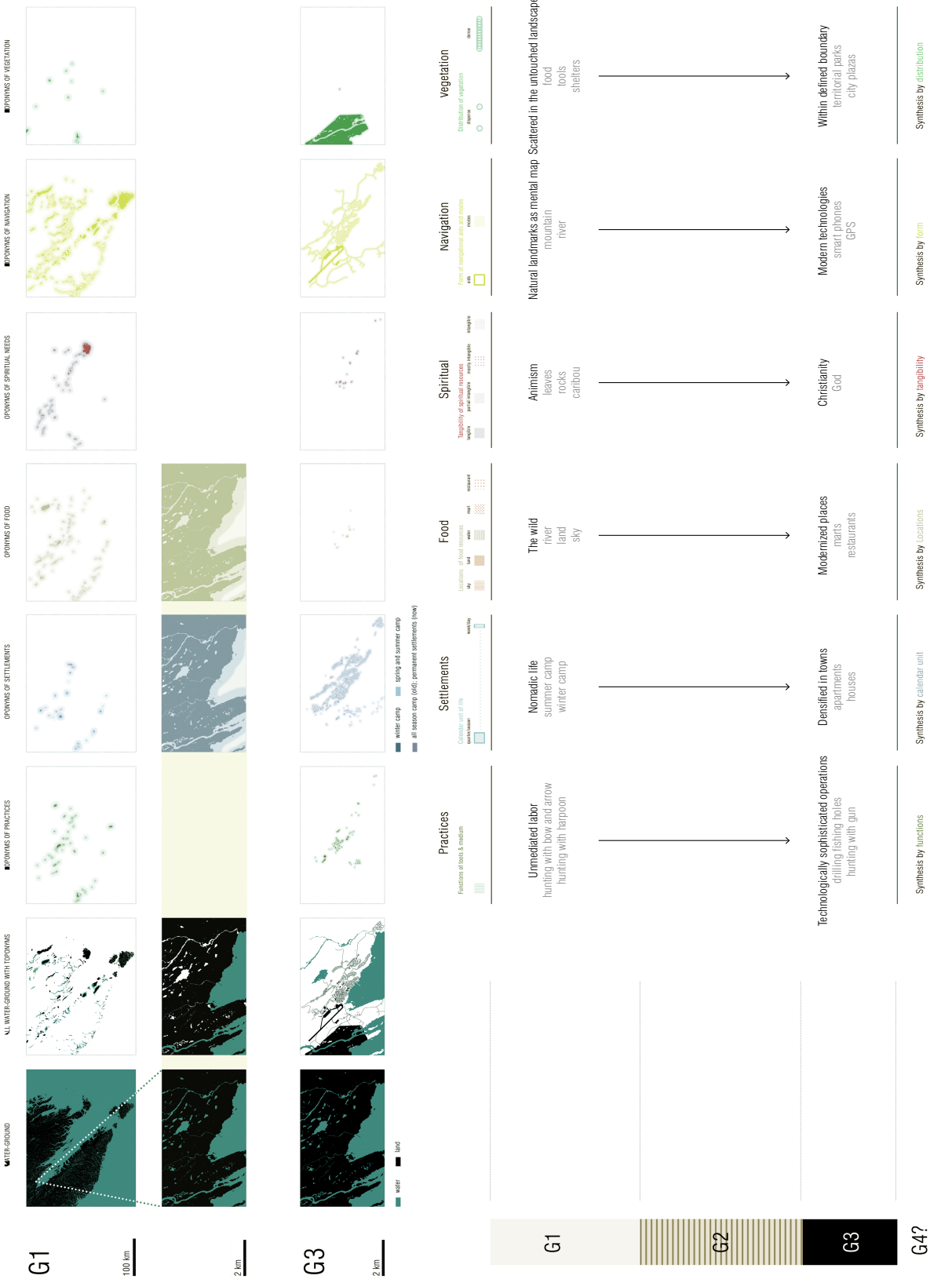


Figure 34 By comparing the distribution and meanings of toponyms, a consistency was found between traditional and modern place names in the place name index.

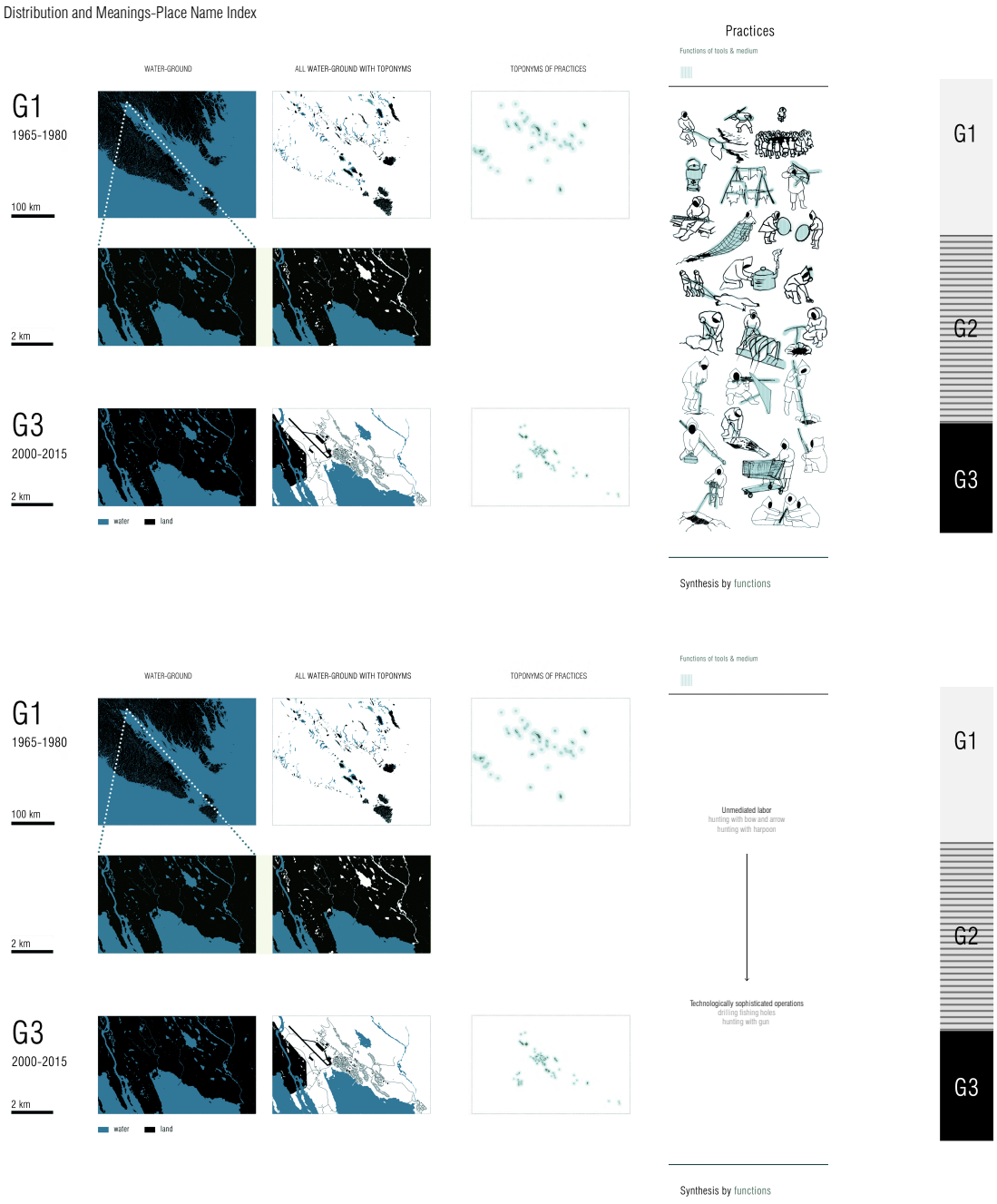


Figure 35 Practices at the floe edge have shifted from unmediated labor to technological operations.

CHAPTER 5 ARCTIC REALITY-TRAVEL NOTES IN THE ARCTIC

As a researcher and designer, I was funded to travel and understand the arctic landscape through my own experience. After I returned, I tested what is confirmed and what is challenged to that condition, through writing 8 poems.

As I revisited the site through documentation and imagination, my previous learnings about it gradually blurred, becoming memories, and was overlaid by arctic realities “inside” me.

The land is strong, intimidating, and full of mysterious contingencies. It is shifting. The knowledge of elders is no longer enough for survival in new conditions.

Figure 36 View of Iqaluit Airport from a plane's side window.

Arctic Reality

A dream closest to the arctic land suddenly awakes.
Dense, violent steam of snow is surging on the boiling asphalt,
magnetically attracted to the aircraft,
as it bumps to stop.

The crowd bursts into huge cheers.
It is a successful landing,
in the country of contingency.

Figure 37 A street of residential area in Iqaluit. The bright colors of the houses display striking contrast with the surroundings.

Figure 38 View of sea ice from the window of Nunatta Sunakkutaangit Museum.

Hydrogen Oxide

You say you cannot bear to part with this silent country.
Your lingering whisper, your vague smile, and your naughty play.
Everything that encounters you forgets what it is.

A city drifts to float on your sea.
Telephone poles are wandering in violent storms searching for a mooring buoy,
Elevated utilidors are running through brine channels in sea ice,
Buildings with bizarre portholes are cruising.

Even the sea piles up your mountain terrains.
Snowmobiles traverse the plain chasing their prey relentlessly,
Marine mammals secretly live in cave labyrinths,
Frozen tides stand rocky firm.

Figure 39 Ice everywhere in Iqaluit.

Figure 40 Sea ice hills on a skidoo trip.

People blame you for all the miseries and sufferings,
They want a docile city and
a humble sea.

So they
Stress you,
Confuse you,
Cut upon you,
Breach into you,
Spill all over you,
Excavate beneath you,
so hard.

They may have heard you say,
you cannot bear to part with this silent country.

Figure 41 Sunset time in Iqaluit.

Photons

The smallest particles,

on this vast land.

The weakest energy,

In this fierce universe.

They say you would be swallowed,

By the dormant, sluggish, dark, and terrifying things here.

But they forget,

You are destined to dance, spin, and jump, swiftly.

None can be more tenacious than you.

None can be more enduring than you.

Figure 42 Northern light in Yellowknife.

Figure 43 Quiet night in Iqaluit.

Countless of you are
overshadowed by patches of hazy green.
But you still vie with each other for a speech to me,
A speech about a successful hunting day of my ancestor,
A speech you have carried with you from a million years ago,
in a million-light-year journey.

As I gaze at you,
A fragment of my life panorama is colored, projected, burned, and then rains down.
And then, another piece follows another.
I chase them, running out of all my persistence.
Why,
Has nobody told me,
What I can have is only
the piece being lit
as I gaze at you.

Figure 44 A trip riding skidoo on the sea ice.

Beast

Engines vibrate
thunderously
Violent belts grind
any irregular snow.

A beast is storming ahead.

Its footprints draw illegibly.
Its lingering warmth is soon drowned.

A beast is storming ahead.

Figure 45 **Violent** airflow in Iqaluit Airport.

Name

I have always thought about
All the fathers and grandfathers.

What could they have named this giant thing,
Who flies over
mountains and seas,
In a fishing morning,
a seal's sunbathing,
a caribou's river crossing,
oh, and sometimes,
in a polar bear's nap.

Figure 46 Iqaluit cemetery in Apex with rib bones from a bow whale.

Rib bone

It is bright, clear, and warm.
Children are playing.

Why,
On this great wildland,
Disquieted.
A secret energy bothers me.

Black pressing flows,
And imponderable depths.

Figure 47 Iqaluit cemetery in Apex.

Dance

Hey, they say, come near us.

Don't you want to dance with us?

You hold your gorgeous petals.

No, I can't.

I love them.

If I leave, I will die.

But they are not real, they say, they are too pretty to thrive here.

They will leave you anyway.

You see them dancing high, shining beyond the mist,

With their green elves.

Figure 48 Inuit Artist Becky Qilavvaq showing her amuati made by her mother.

Amuati

It is an amuati my mother made for me,

It took her seven years.

But,

It is not my amuati.

It is like saying,

This is my mountain,

This is my ocean,

Nobody says that.

Figure 49 Traditional knives (for raw meat cutting) used by women in Becky's house.

CHAPTER 6 NEW PLACES WORTHY OF BEING NAMED

What can landscape architects do to help channelize this continuity into new generations: G4, G7, even G11? How can this continuity evolve so as to respond to future cultural, technological, and especially climatic changes? The answer lies within toponymic consistency. To imagine that continuity in a context of change, six categories of places worthy of being named are identified (**Figure 50**). Worthy of being named by the Inuit means these interventions play roles in the arctic ecosystem in ways like any local nonhuman elements. They integrate into it as flows and exchanges of energy, matter, and information.

The six categories outline distinct ways of synthesizing traditional and modern contexts of culture, technology, and nature. They make G1 filter through the place name index to G4, bringing the original condition to new and enriched relationship with natural landscape. Unlike nostalgic and sentimental attempts to restore a lost narrative of inhabitation, the six synthetic categories structure a framework for new histories to be written on land and ice. This new, creative inhabitation of landscape that motivates life and is facilitated by technology. Hopefully, in the future, G4 would become G7's G1.

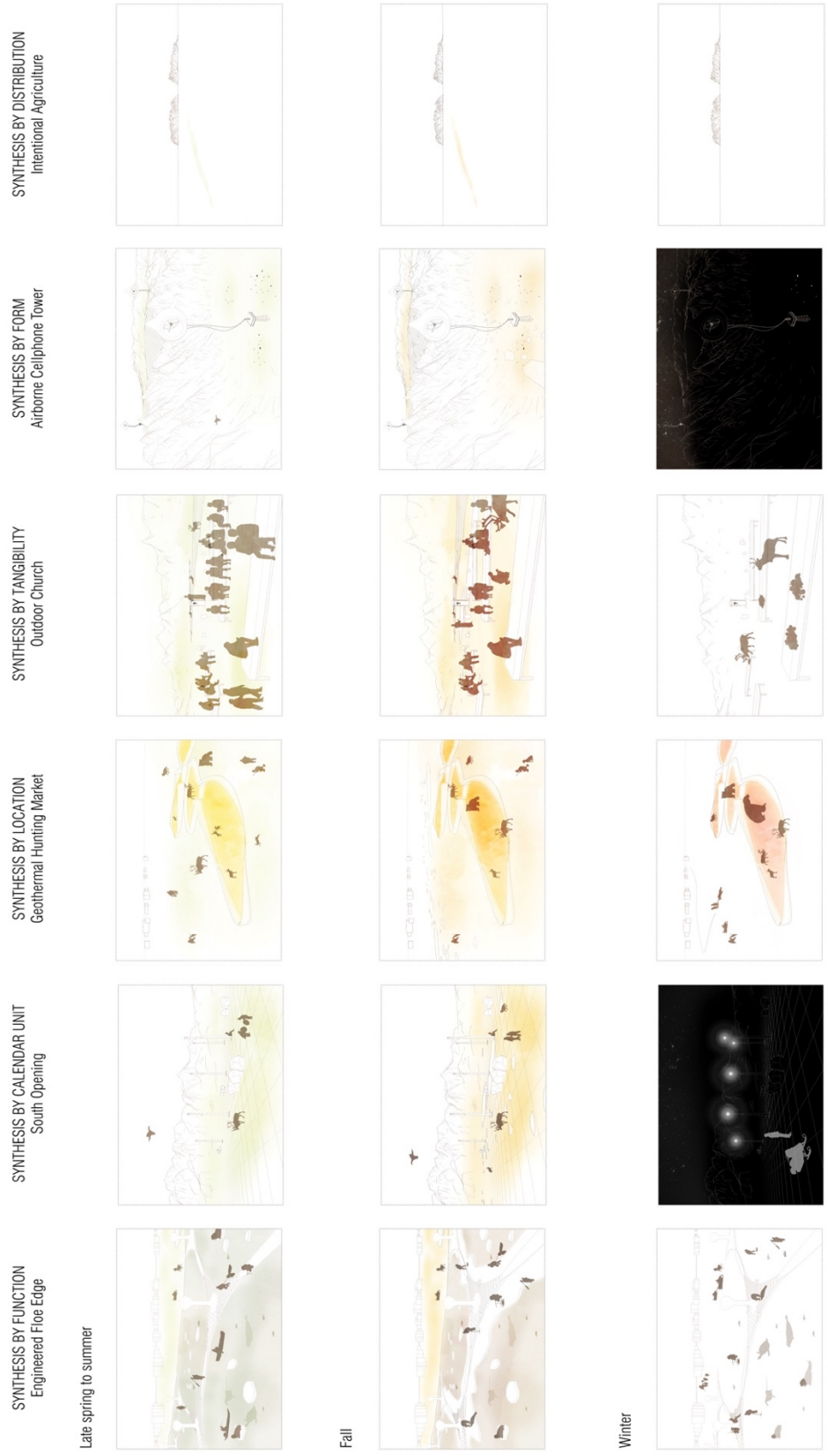


Figure 50 Six new categories of places worthy of being named.

Synthesis by Function: Engineered Floe Edge

Typically, Inuit practices are located along the ice-water interface. As the most prevalent type of such interface, floe edge is where the extension of land-fast ice meets sea water. Under the category of practices in the place name index, practices at the floe edge have shifted from unmediated labor (with only traditional tools made from natural materials) to more sophisticated, technologically improved operations, such as using drills to cut fishing holes and guns for hunting. The biggest difference among generations has been the media of such practices.

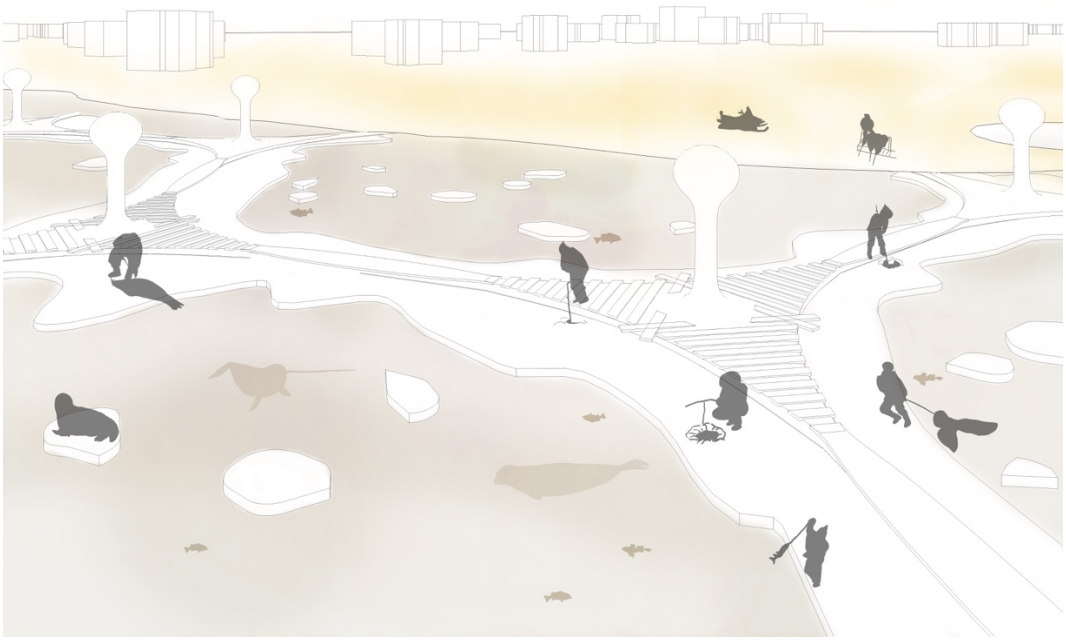


Figure 51 New engineered floe edges with anchors on land are deployable hollow steel or aluminum structures floating on the surface of sea.

New engineered floe edges with anchors on land are deployable hollow steel or aluminum structures floating on the surface of sea in coastal areas (**Figure 51**). They are technological platforms that accommodate old and new practices. They form thermal conduction passages connecting air, sea ice, and ocean currents (**Figure 52**). In early fall, they accelerate freezing and grow ice platforms around them. In spring, they speed up melting and expose flowing water underneath. This microclimate manipulation makes up for the lost time caused by climate change. The prolonged and thus dangerous ice-water transitional period will be shortened. Hunters such as polar bears and humans can enjoy extended hunting seasons in fall. In spring, hungry fishermen and foraging birds who cannot penetrate ice or go below water can get rid of pile-up ice not far offshore.

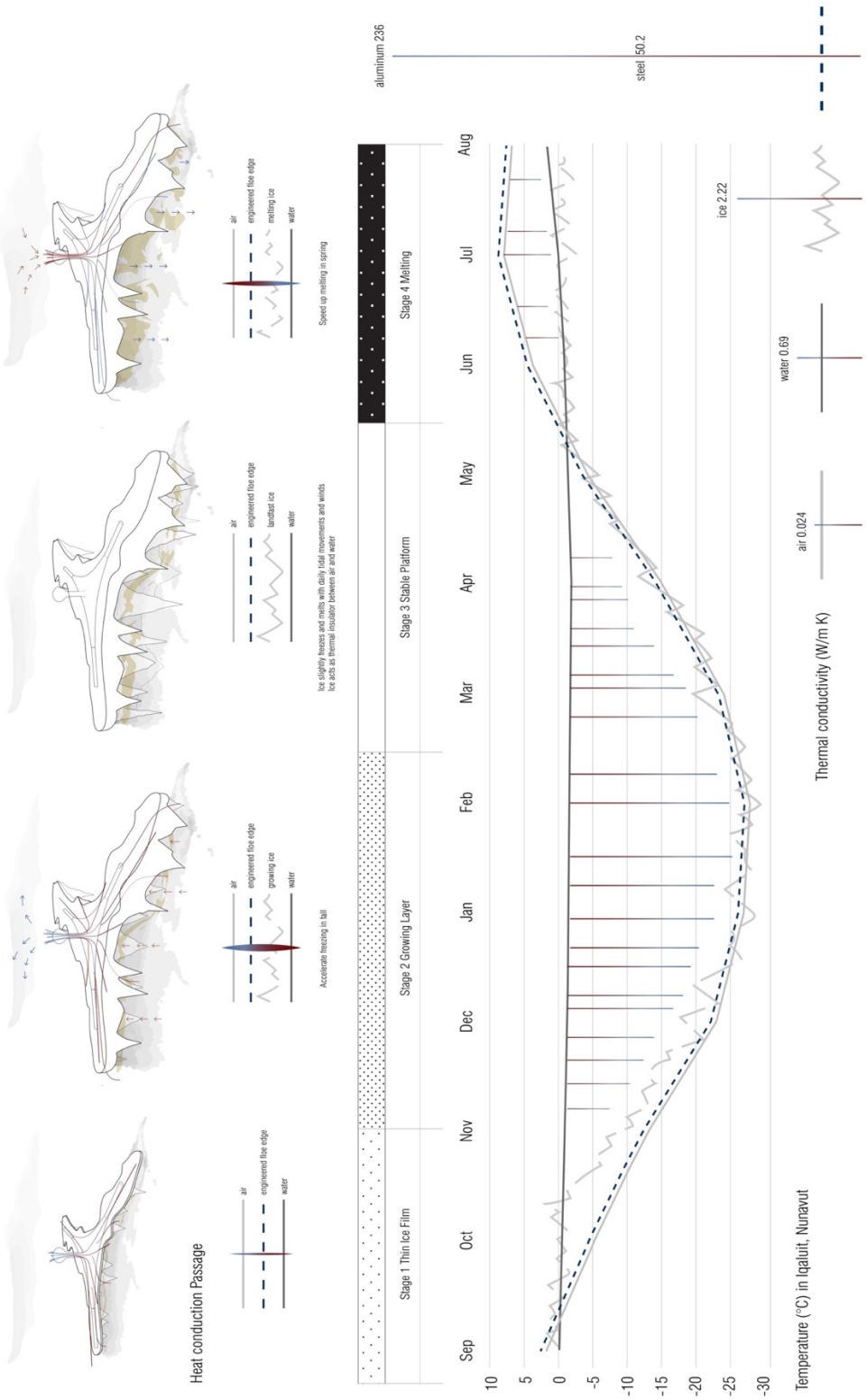


Figure 52 They form thermal conduction passages connecting air, sea ice, and ocean currents (**Figure 37**). In early fall, they accelerate freezing and grow ice platform around them. In spring, they speed up melting and expose flowing water underneath. This microclimate manipulation makes up for the lost time caused by climate change.

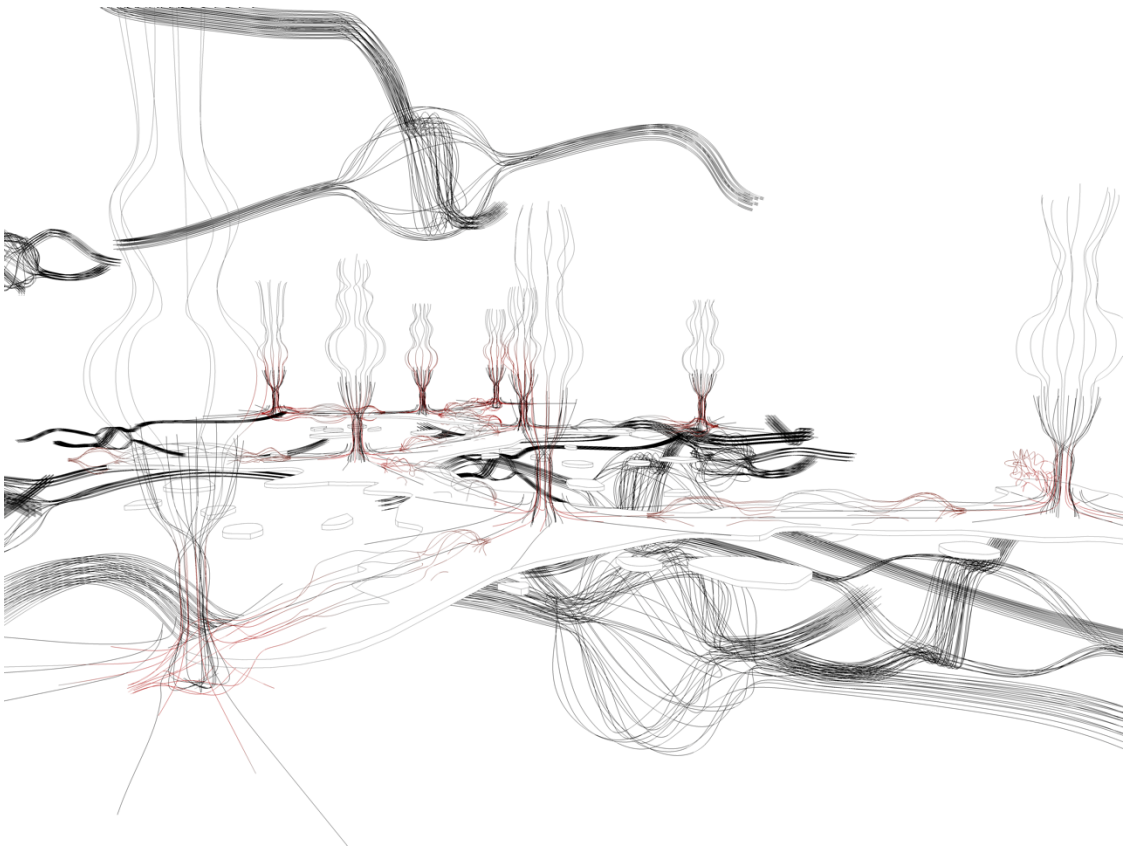


Figure 53 Engineered Floe Edge as thermal conductors in ecological monism view. Flows of energy is the essence of this intervention. Only ice platform as the inflating element is given substantial form here.

These engineered floe edges become inflections of thermal flows in continuity with the metabolism of animals (**Figure 53**).

They can be placed in coastal areas where travel routes from the city reach out to the sea. One possible site in which to locate this new engineered floe edge is within 1 km of the shoreline along the in Koojesse Inlet, Nunavut (**Figure 54**). This site has very low slope and complex networks of shallow tidal drainage channels (Hatcher 35-45). Also, sewage water can be treated here. In Meretta Lake at Resolute Bay, Nunavut, sea ice algae was discovered to have the ability to clean sewage water (https://www.sciencedaily.com/releases/2000/11/ 00112 21 83430.htm). In zones not covered by sewer systems, the sewage discharge may be cleaned by sea ice algae grown in brine channels, which are within the sea ice facilitated by this new engineered structure.

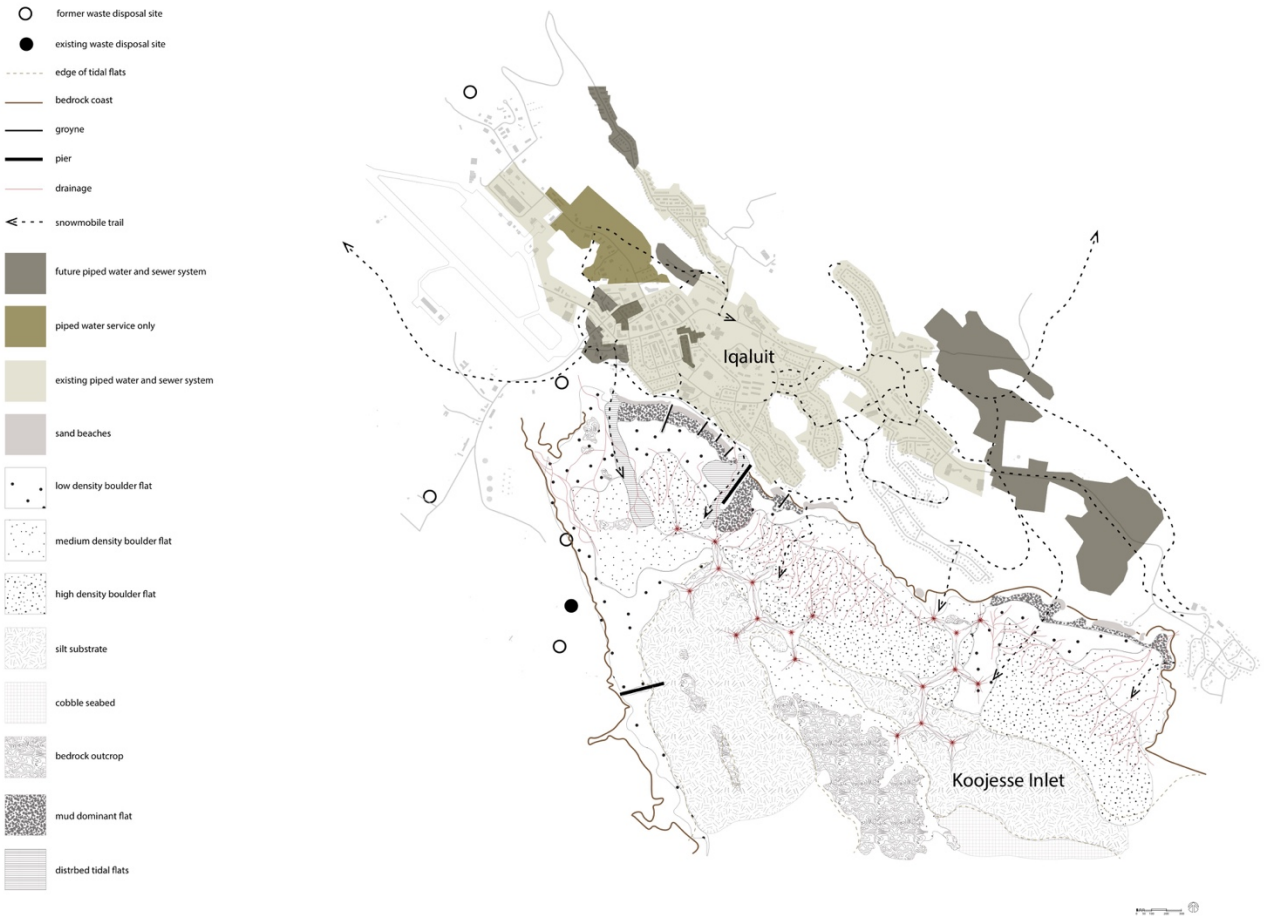


Figure 54 Mapping of coastal area in Koojesse Inlet near Iqaluit, Nunavut. Selected as the location for engineered flow edge.

Another possible site would be near the floating multi-year icebergs, which provide important fresh water habitats for marine animals and waterfowls. It may be a way to slow down the recent melting of these icebergs. Because some of them are always drifting, a kind of non-fixed engineered floe edge may be more ideal for these conditions.

Synthesis by Calendar Unit: South Plaza

During the past 50 years, the Inuit have transitioned from nomadic seasonal camps to modern towns and a sedentary lifestyle. Under the category of settlement, the biggest difference among generations has been the calendar unit for seasonal settling cycles. However, as Béatrice Collignon wrote in *Knowing Places: The Inuinnait, Landscapes and the Environment,* "An Inuinnaq child …… grows up in a context of great mobility, but it is also a context of great stability."

New South Plaza brings the southern calendars into the cold Arctic. They are portals of artificial daylight fed by monitored light coming from southern cities that share aircraft and sealift connections with Nunavut (**Figure 55, 56**).

They reproduce the continuous inflections of southern day light into the darkness of an arctic winter. They will condition Inuit hopes and dreams according to their own values and needs.

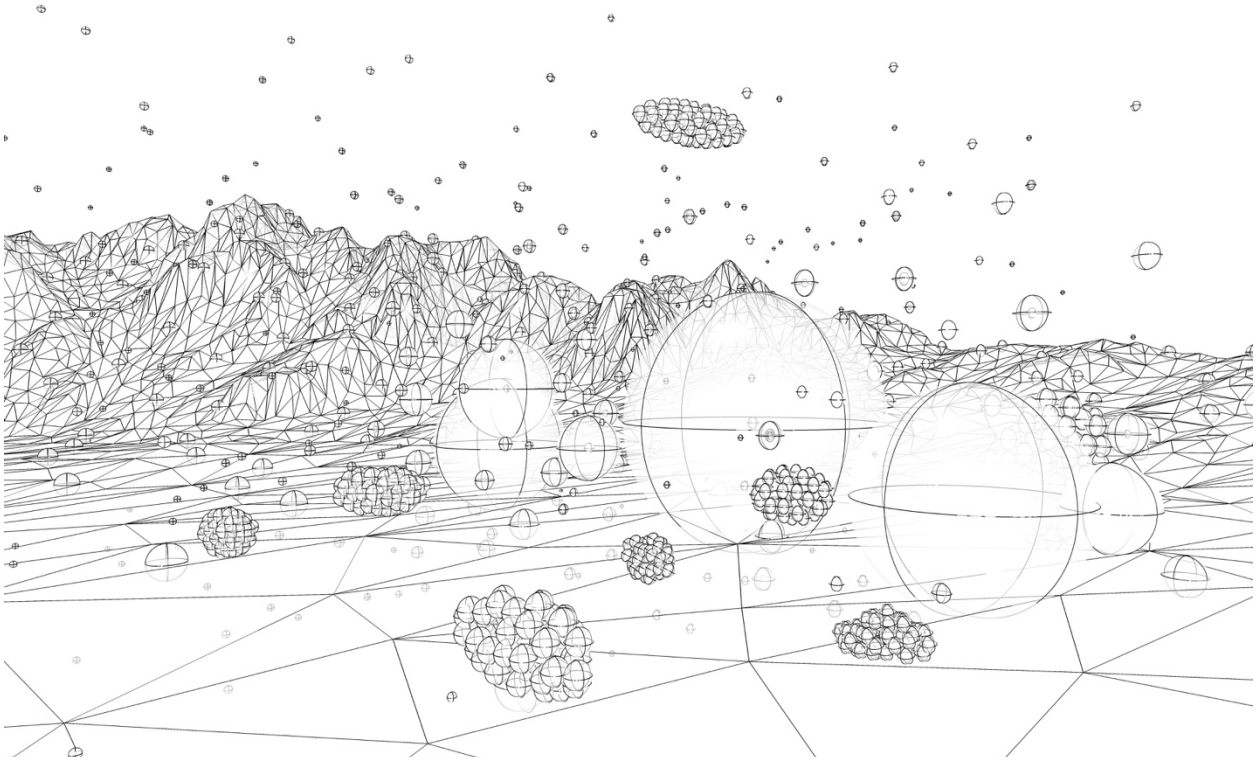


Figure 55 New South Plaza in ecological monism view. Vitality of particles (photons) is the essence of this intervention.

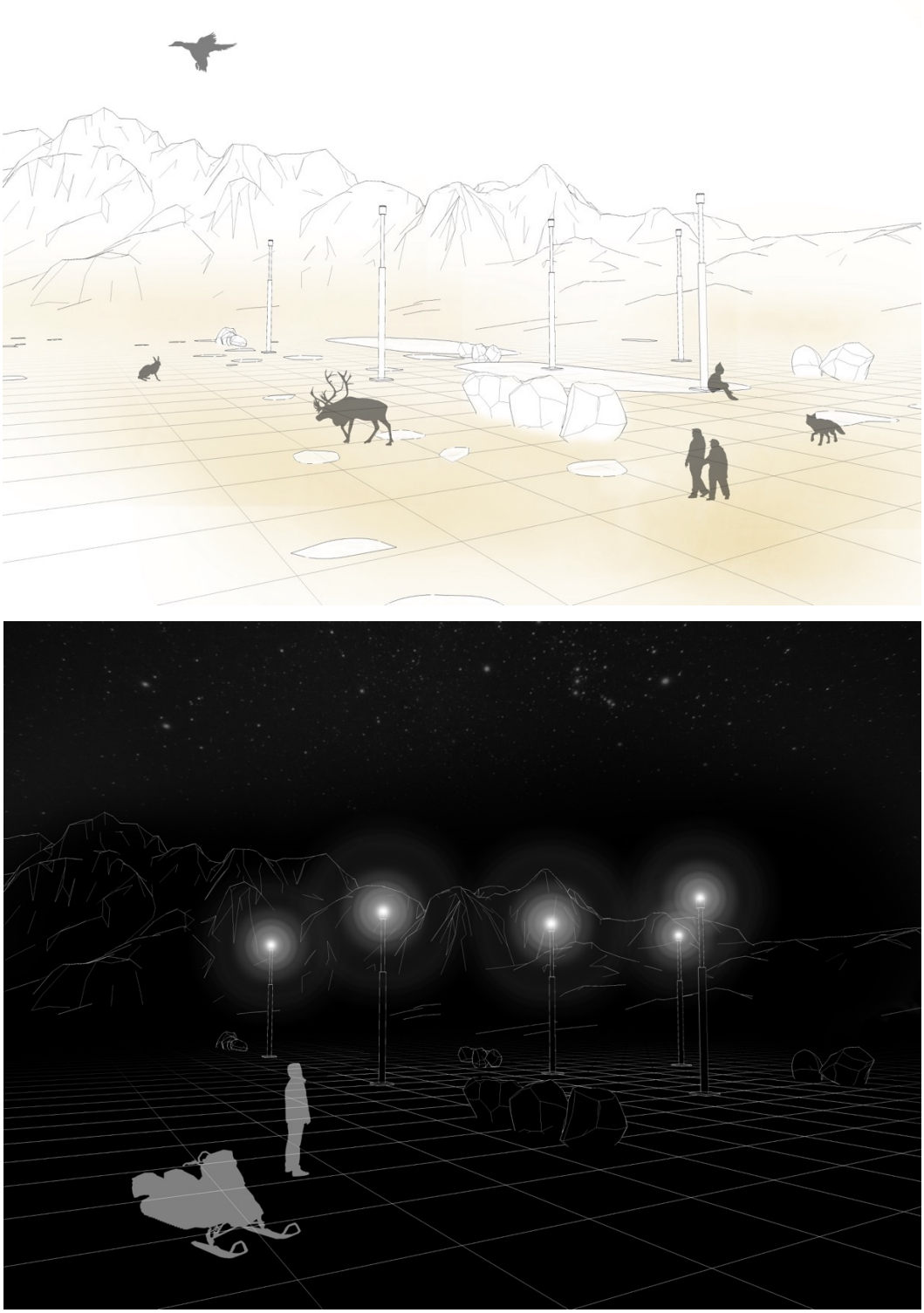


Figure 56 New South Plaza (top: autumn view; bottom: winter view).

Synthesis by Location: Geothermal Hunting Market

Under the category of food, the biggest difference among generations is source location, transitioning from the wild to modernized places such as indoor markets and restaurants.

In Nunavut, imported food prices are too high for many residents to afford. Local food from wild animals is still their first choice.

Figure 57 Geothermal hunting market.

New hunting grounds (**Figure 57**) supported by geothermal technologies are places that condense heat flows and direct animals to come near the town. They are warm hunting markets in the cold landscape. People may name such places something like country-food-U-pick.

They can be located on open ground, where underground geothermal energy has already formed upheaval flows. One possible site in which to locate this new hunting ground is old Iqaluit airport-specifically, on its runways (**Figure 58**). Iqaluit airport has started to sink into the ground because of melting permafrost and at a faster speed than its surroundings. This is because it was built on an intricate ice wedge network near open ocean (http://www.cbc.ca/news/canada/north/thawing-permafrost-a-

growing-problem-for-iqaluit-airport-1.1371922). It literally covered several big water channels, and the emergent trouble has followed upon that condition from when it was built.

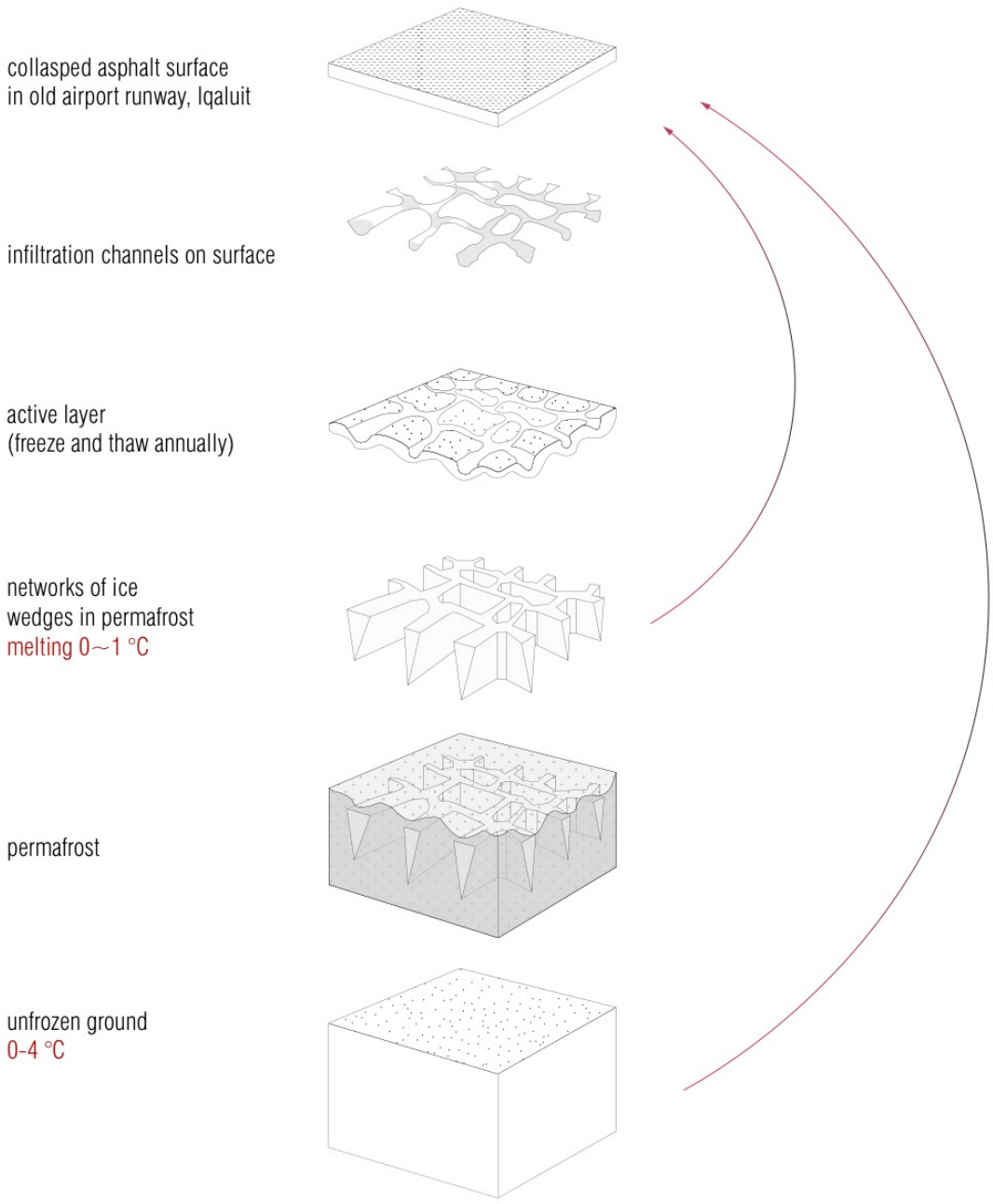


Figure 58 One possible site in which to locate this new hunting ground is old Iqaluit airport-specifically, on its runways. Iqaluit airport has started to sink into the ground because of melting permafrost and at a faster speed than its surroundings.

Synthesis by Tangibility: Outdoor Church

Under the category of spiritual needs, the biggest difference among generations is the tangibility of Inuit belief sources. They used to be people who believed in animism; now they are mostly Christians.

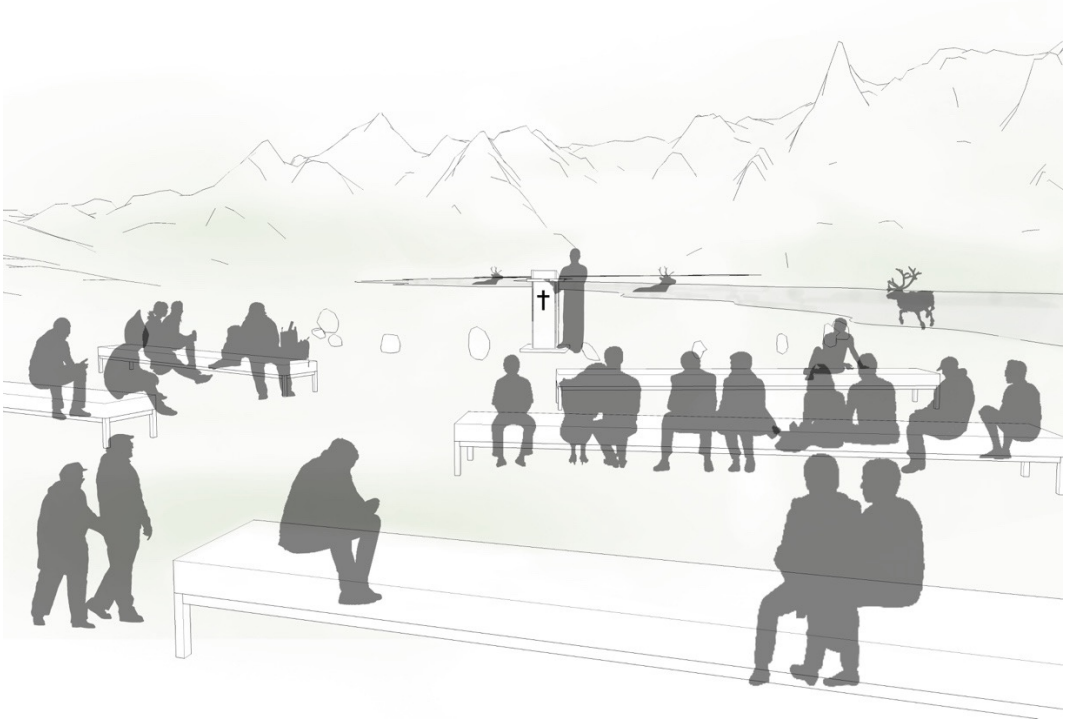


Figure 59 Outdoor church near caribou crossing.

Outdoor church close to caribou crossing rivers is a new place of worship and a new houses of gods (**Figure 59**). The antlers of caribou and reindeer are symbols of spiritual authority for both Christianity and Animism (**Figure 60**). The benches of the church are feeding compartments to provide food services to caribou and other animals.

Figure 60 The antlers of caribou and reindeer are symbols of spiritual authority for both Christianity and Animism.

Synthesis by Form: Airborne Cellphone Tower

Under the category of navigation, the biggest difference among generations is the form of navigational aids and modes of operation. People used to rely on their mental maps by depicting the natural landscape as landmarks in their minds; now they use GPS and other new technologies, such as smart phones.

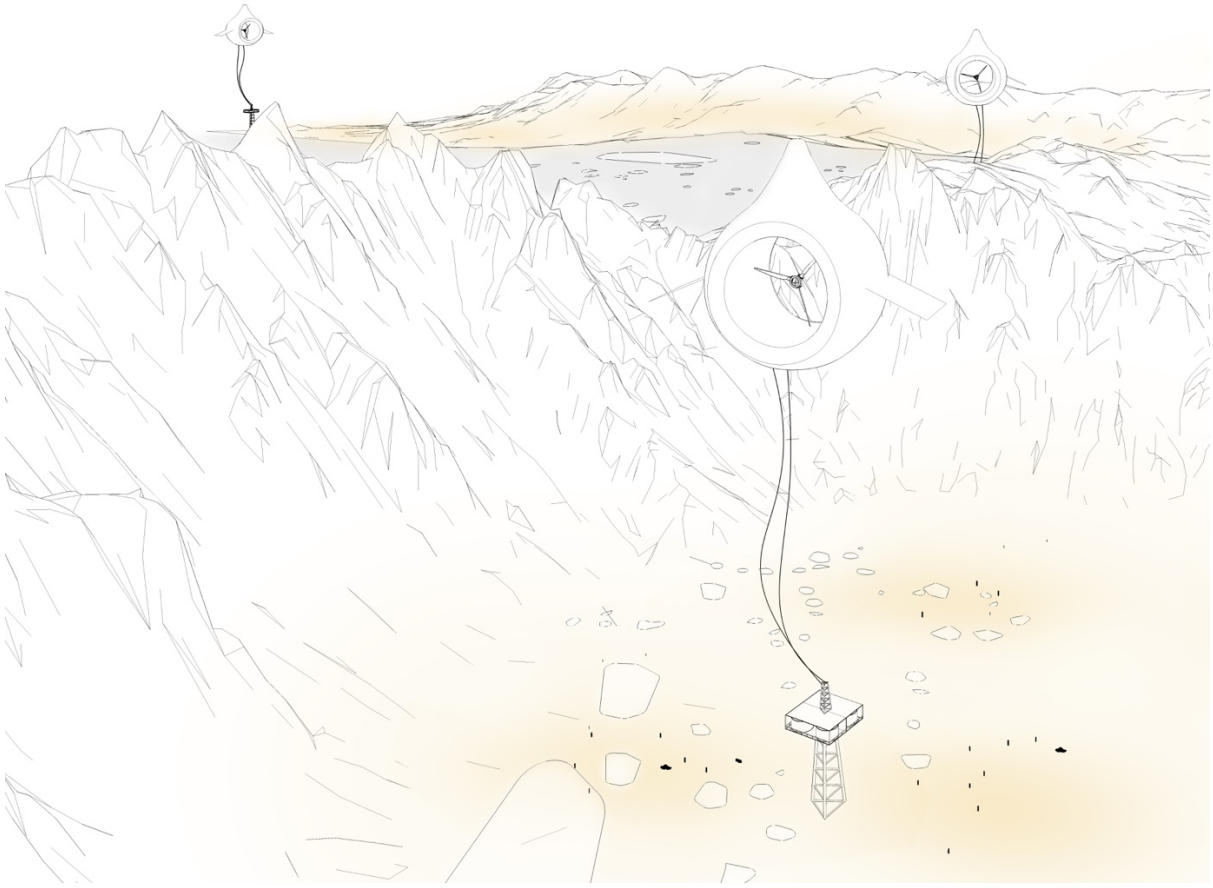


Figure 61 Airborne cellphone tower, autumn view.

Airborne cell phone towers (**Figure 61**) claim technology as a new physical landmark. They have the shape of the Inuit hooded hat, and they fly high as if the Inuit are navigating through the landscape.

Synthesis by Distribution: Intentional Agriculture

Under the category of vegetation, the biggest difference among generations is the distribution of plants. They used to be in the untouched wild and scattered throughout the landscape. They sustained Inuit lives by providing food, tools, and shelters. Now the Inuit have only those places with defined boundaries drawn by the government, such as national parks and city plazas.

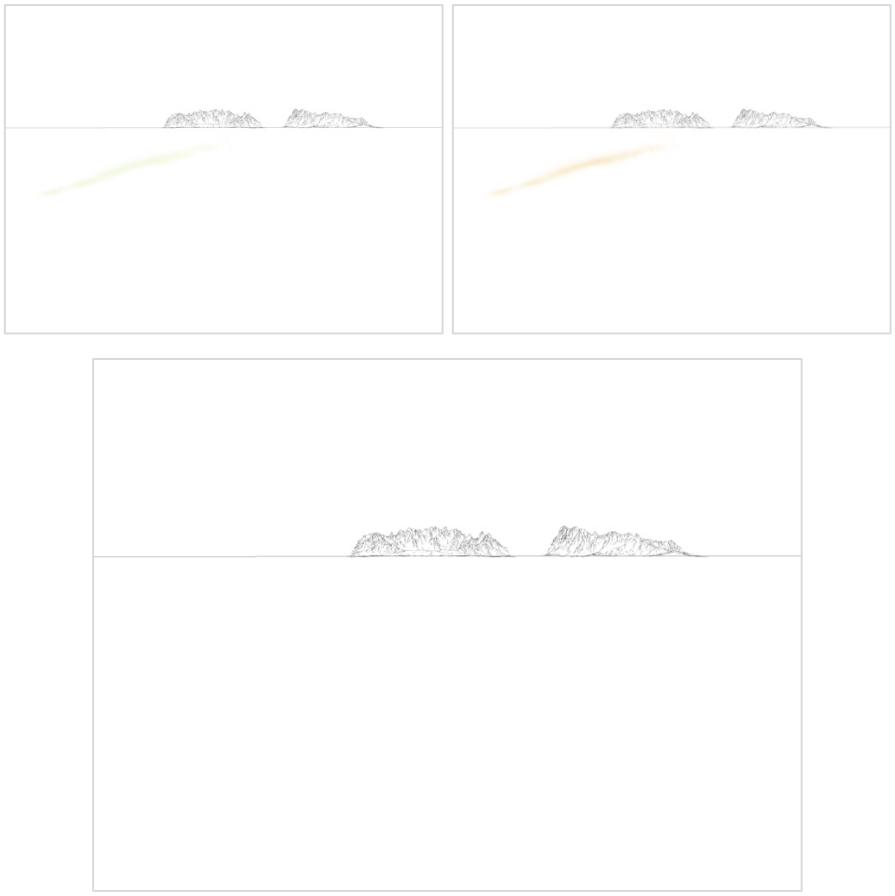


Figure 62 Intentional agriculture (top left: summer; top right: autumn; bottom: winter).

Intentional forms of agriculture (**Figure 62**) conducted by Inuit riding snowmobile to the wild are new, engaging practices where human agency is part of the ecology. The corridors are planted in spring, flourish in the short summer, and become useful materials when winter comes. For example, Arctic Cotton is used by the Inuit to make wicks for their traditional oil lamps. These new corridors are planted by wide dispersal of seeds, but they are also defined by technological tracks of snowmobiles. They are lines in the landscape that both mark and generate landscape. Maybe they will generate new trails, as edges or by functioning as snow fences.

New Arctic Urbanism

In these representations of new places worthy of being named, energy, matter, and information are visualized as waves and particles responding to environmental fluctuations. The interface or boundary between the seen and the unseen is dissolved in liquid states. Technologies and human practices act as inflections on those waves and particles.

After completing and submitting this thesis in July 2017, I will travel back to Nunavut and ask Inuit people to name these new places. I will also ask them to select specific locations for them.

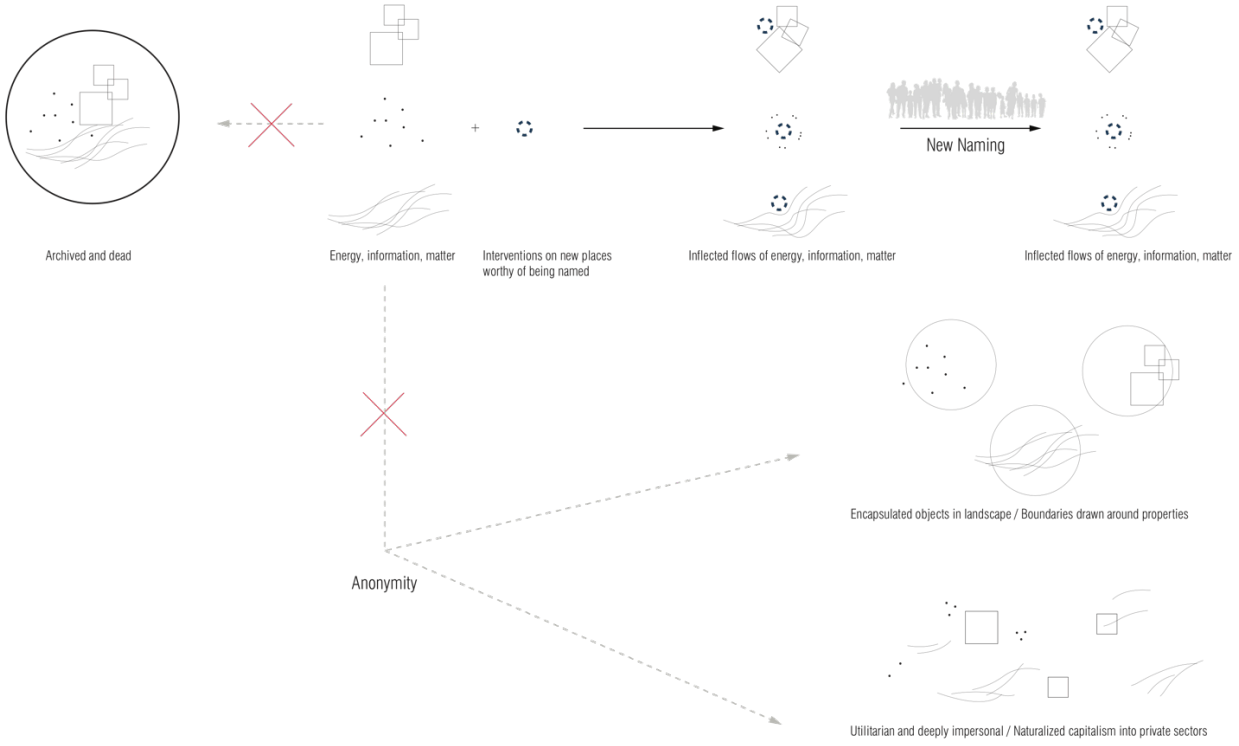


Figure 63 Naming of these "inflected flows" on site is part of a new, collective effort to construct new urban situations that claim the nature of city as people and flows in actions. It is deeply personal at the communal level. It is not aimed at naturalizing capitalism into private sectors. In this way, traditional place names can remain alive instead of archived and dead.

The "inflected flows" in these new places are made possible by amenities without commercial values. Naming of these "inflected flows" on site is part of a new, collective effort to construct new urban situations that claim the nature of city as people and flows in actions. It recognizes the current

generation's knowledge and transfers the power of public space into public interest (**Figure 63**). If "Language is itself memetic," then it is especially meaningful to assert the role of indigenous language in constructing a new arctic after the defunct residential-school system in the twentieth century—because from language flows attachment to place. This is not about the anonymity of places that only signifies economic prosperity. It is deeply personal at the communal level. It is not aimed at naturalizing capitalism into private sectors. Instead, it is about supporting Arctic-specific metabolism.

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